# ONGRESS JOURNAL \*\*





# LINK-BELT Heavy-Media Preparation Plant

#### solves problem of cleaning No. 3 Pocahontas seam

PICTURED here is the Link-Belt Heavy Media Preparation\* Plant used by Pocahontas Fuel Company Incorporated to uniformly clean Pocahontas No. 3 Seam coal at their Itmann mine, in Wyoming County, West Va.

The world famous by-product coal of the Pocahontas No. 3 Seam does, in some areas, contain impurities and economical cleaning presents a problem.

With the installation of the Link-Belt Heavy Media Preparation plant, Pocahontas Fuel Company Incorporated is producing 700 tons per hour of a uniformly high grade coal from this seam at their Itmann mine.

Link-Belt Multi-Louvre Dryers, which efficiently remove moisture, participate in the cleaning operation. Five clean, dry, accurate sizes are individually loaded or blended—and refuse is disposed of by the Link-Belt handling system.

This Link-Belt-engineered preparation plant is another instance of Link-Belt's continuing efforts to aid the mining industry in solving challenging problems. It's also an example of how Link-Belt offers one dependable source . . . one undivided responsibility for a complete modern coal preparation plant.



Link-Belt Float-Sink Concentrator permits high or low specific gravity separation. High accuracy is achieved even when amount of impurities in feed fluctuates. Cleans larger sizes, reducing manual picking.

The Heavy-Media Separation Processes are licensed by the American Zinc, Lead and Smelting Co. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., are their sole Technical and Sales Representatives for these processes.

## LINK-BELT engineered, erected and initiated successful operation of this complete Heavy-Media plant

Included in the equipment supplied by Link-Belt for this Itmann plant, are the following major components manufactured by Link-Belt:

- 3 Float-Sink Concentrators
- Media Thickeners
- 4 Multi-Louvre Dryers
- Rotary Car Dumper and Mine Car Handling and Dumping Equipment
- Shaker Screens
- Apron Type Loading Booms
- All Conveying and Power Transmisssion Equipment



#### COAL PREPARATION AND HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Springs (South Africa).

Traveling louvres cause constant agitation of coal as it moves through the Multi-Louvre Dryer. Mixing plus constant acration promotes fast, gentle, uniform drying. Accurate control is maintained at low temperatures.



# YOU'LL FIND THE LOWEST PRODUCTION COST PER TON WHERE COAL MINING AND COAL PREPARATION OPERATE INDEPENDENTLY



S-D "Automatics" moving over Surge Bin is one continuous smooth operation, opening and closing doors automatically.



The "Automatic" Drop Bottom car is the only practical method of completely filling a Surge Bin to track level.

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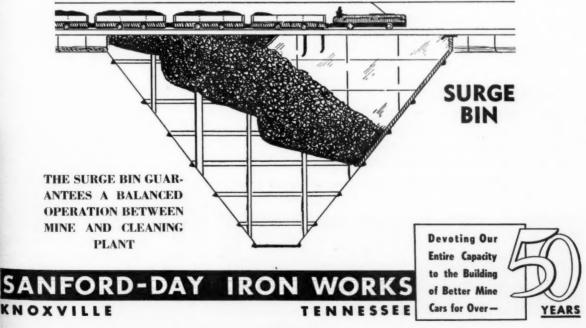
You only have to look around a bit to find the answer to rock bottom production costs of coal. The facts are wrapped up in those mines where mining at the face and the preparation plant can function independently of each other.

The S-D Automatic system of coal transportation from mine to cleaning plant is your guarantee of a continuous, even flow of coal, so necessary to low production costs. This includes an adequate Surge Bin which will serve as a temporary storage of coal in transit... the production balancing point between mine and preparation. This Surge Bin plus S-D "Automatic" Bottom Dumping Cars is essential to the low cost, independent working of mine operation and preparation plant.

Any cleaning plant works best, and at the least cost, with an even continuous supply of coal. The Surge Bin continues to supply coal to the preparation plant when, for any cause, there is a delay at the face.

With an adequate surge bin, one shift operation of cleaning plant is often sufficient to take care of two shift operation of mine. Breakdowns or delays at the preparation plant need not stop mine production because the surge bin will take the coal until repairs are made.

For additional facts and details, phone H. W. Sanford, Jr., Sales Manager, 3-4191, Knoxville,



from the PYRAMID OF KHUFU...

to the MESABI RANGE ...

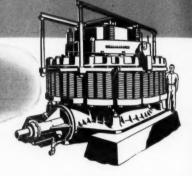
IRON
HAS COME
A LONG WAY

THE largest of the *Pyramids of Gizeb* is that of *Kbafa*, built of limestone cut in the quarries of the Nile Cliffs and floated across the river to the site of the tomb.

It is claimed by some historians that the oldest from to be discovered was in the form of a tool found in an air shaft of this great pyramid of Khufu, which was built about 2800 B.C. From Khufu to the modern marvel of the Mesabi Range, iron has come a long way... to become the metal of greatest service to man.

Since their introduction, "SYMONS" Cone Crushers, with their great capacity for more finely crushed ore at lower cost, have been a big factor in the production of iron ore ... and have achieved outstanding performance records in all of the great ore and industrial mineral operations the world over.

NORDBERG MFG. CO., Milwaukee, Wisconsin



"SYMONS" Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

"SYMONS" . . . A NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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"SYMONS" Primary Crushers



Grinding Mills



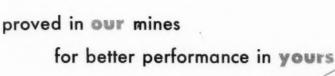
Mine Hoists



"SYMONS"
Vibrating Bar
Grizzlies and Screen



Diesel Engines



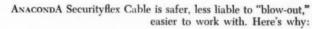


We-at Anaconda-are miners ourselves. We know shovel cable because we use lots of it. Safety and uninterrupted flow of power are important in any mining operation. In both respects we know Securityflex\* Type SH-D has a good record.



for longer "failure-free" service on big shovels, insist on

**Butyl-Insulated Securityflex above 2kv** 



BUTYL INSULATION. This accounts for improved resistance to moisture, ozone, heat (up to 80C).

NEOPRENE JACKET. Here is real flexibility and great strength engineered for this specific tough use. Handles well, has high impact resistance and lasts longer in all weather.

RUBBER-CORED GROUND WIRES. This safety-first feature prevents kinking, gives greater shield contact, and cushions the wires.

COPPER-COTTON SHIELD. Special new-type shield makes splicing easier, faster without damage to insulation. Eliminates chafing failures.

Ask your Anaconda Sales Office or Distributor to show you this and other ANACONDA portable mining cables. Learn how continuous improvements have made these famous cables better . . . for safety . . . and for increased production at less cost in your mine. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

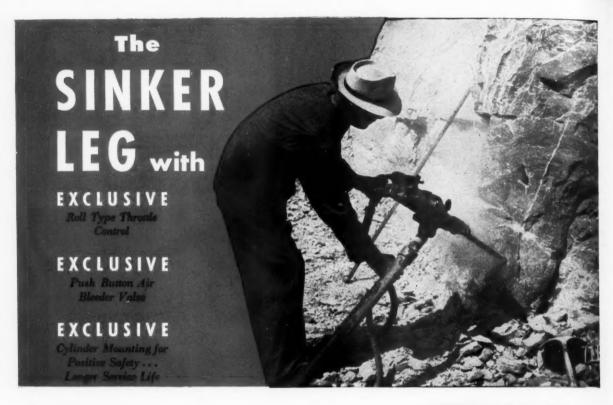
This is Butyl-Insulated Securityflex Type SH-D. For your drills use patented rubber-cored Type G Securityflex Portable Cable.

C352

the right cable for the job A

NACONDA wire and cable

[ Page 3 ]



Here's real savings in labor...man hours...and drilling costs... and 45% more drilling footage by actual tests!

The miner can carry the entire setup—Thor Sinker and Thor Leg—into the smallest tunnel or closest corner, set it up in an instant, start the hole... and then let Thor do the work! All he does is control the constant pressure feed by operating two simple throttles—the only automatic controls in leg operation!

Think of the savings... both in operating costs and air consumption. With carbide bits the Thor Leg can replace drifters—and heavy mountings on scores of heavy duty operations... can drift in tunnels where drifters won't fit. Write today for catalog data.

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FULLY AUTOMATIC—A quick, easy setup—just start the hole—set the leg at any angle between 30 and 45 degrees. .the leg does all the lifting—all the constant pressure feeding...control the feed with a turn of the wrist!



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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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your best bet for the best bit ... for every job

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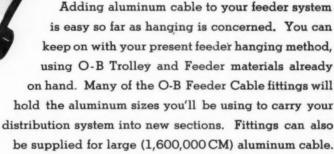
**CABLE** 

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bits

om-O". O-B Type-C Feeder Wire Insulator



A representative group of O-B fittings for copper or aluminum cable is shown here. You'll find others in the O-B No. 27 Catalog — and of course, your O-B representative can tell you many things about current feeder hanging methods. Let him help work out a system for your feeder circuit extensions!

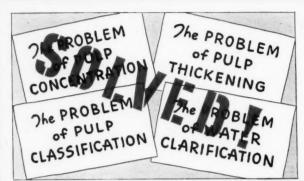


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# MILLING and ORE DRESSING MEN Can Change WASTE to PROFIT with #+P

CYCLONE THICKENER EQUIPMENT

Cyclone Thickener equipment is turning waste into profit at a large eastern flotation mill, where agricultural lime is now being recovered efficiently and quickly from zinc and lead flotation tails.

This particular installation consists of eight 14" Cyclones. The Cyclones receive the feed material as a suspension of solids having a specific gravity of 2.50. By rejecting the ultra-fines, which are objectionable, and delivering a concentrated underflow or spigot product, the Thickeners recover approximately 2200 tons of agricultural lime per day. The classification desired and obtained in this operation is 30 microns.

Cyclone Thickeners, which generate forces up to 12,000 times gravity, provide an economical and practical method of controlling solids in Circulating Systems and separating solids from liquids. The Cyclone Thickener's low cost . . . small space requirements . . . minimum upkeep . . . and lack of moving parts makes it the ideal answer to Thickening and Classifying problems.

Heyl & Patterson laboratory and field tests have provided a sound basis for predicting accurately the Cyclone performance on most feeds. For more information send for booklet 5-CT-51 cr send us your problem and we will tell you how a Cyclone application can provide the answer.



A typical installation of five 14" Cyclones. Eight of these 14" Cyclones are now being used to recover agricultural lime from zinc and lead flotation tails.



The standard 3" Cyclone Manifold consisting of feed valve, combination feed chamber and overflow chamber, overflow valve, underflow pan and twenty-two Cyclones. The standard 3" Manifold consisting of twenty-two Cyclones has a capacity of 250 G.P.M. and is designed to operate at 40 PSI.



HEAVY BULK MATERIALS HANDLING EQUIPMENT ALL THE WAY

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#### DEHLER AME SAFETY LAMP

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New Standard Coal Mining Industry

> ...for every good performance reason!

nce its introduction, the National Model Koehler lame Safety Lamp has gained wide acceptance and preference through its outstanding advantages of convenience, compactness and light weight. Check the facts-they speak for themselves.

LIGHTER The "National" Model weighs only 1 lb. 121/4 oz. as compared with the Standard Aluminum Model of 2 lbs. 9 oz. and the Standard Steel Model of 3 lbs. 6 oz.

LOW HEIGHT The "National" Model is only 95%" from base to top of eyelet-small, compact, easy to carry in low coal.

LESS MAINTENANCE Fewer parts, simplified construction, smaller bonnet with fewer and larger vents facilitate cleaning and maintenance.

BUILT FOR RUGGED SERVICE Aluminum alloy construction makes the lamp extremely light in weight yet most durable and strong. It is not affected by moisture-will not rust or corrode. Smaller fount has full wall thickness and capacity so that burning time fully meets the approval of the Bureau of Mines.

WRITE for the informative "National" Model Koehler Lamp Bulletin.

#### ACTUAL SIZE

This is the actual size of the "Na-tional" Model Koehler Flame Safety Lamp.

#### **National Mine** Service Company

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JLK .5 VAY

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and Easy to Handle

Wires of the finest steel in a construction designed for universal dragline service give Tuffy draglines the extra flexibility needed without sacrificing other qualities. It's easy to handle because it's pliable. Tuffy draglines spool better and ride better on grooves. TOUGH

to Withstand Ahrasive Wear

Maximum abrasive resistance is obtained by finer technic in construction of Tuffy Draglines. Materials used in these quality draglines are toughened to withstand more abrasive wear.

HUGS DRUM

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Jerking, pulling and bend stresses do not distort the pla construction of Tuffy Draglin They are engineered with a toughness to withstand stre -and to hold securely to d when casting.



These Tuffys Are Also Special



Tuffy Slusher Rope

Improved 3x19 gives maximum sistance to abrasion . . . is t non-collapsing to eliminate crushing, yet elastic and the enough to take up shock loss



Tuffy Mining Ten

Mining Machine Ropes, Crab Ropes, Winch Ropes — all I Formed (Preformed) and to give maximum safety and —at ultimate low cost. NINE OPERATORS ORDER

THIS GIANT MACHINE
TURNS OUT 27 TONS
OF UNION WIRE ROPE
IN ONE CONTINUOUS
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# NINE OPERATORS ORDER DRAGLINES

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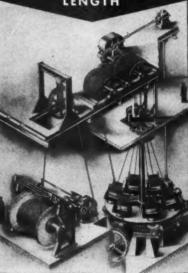
Inder Severe Operating Stresses

perating in dry dirt, wet dirt, sand, meet, rock and minerals and on all ross of equipment, Tuffy Draglines and up under more days of service and move far more yardage than the previous average obtained by sany operators.

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Patented interlaced wire fabric construction gives extra flexibility and stamina. Proof-tested to twice safe working load. Non-kinking. Noncrushing. 10 types.

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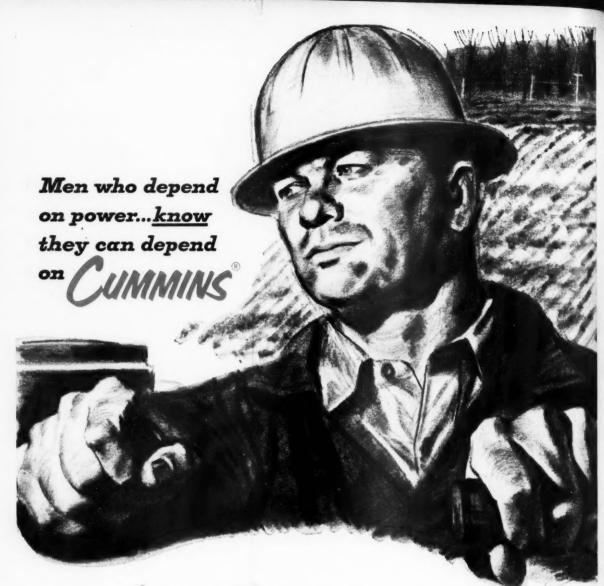
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Miners have learned to count on Cummins Diesels for dependable power day in, day out.

What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built twice. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care-together with Cummins' economy-proved fuel system and efficient parts and service organization—make lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice for men who depend on power.

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# History- Tracto-Shove

Thousands of Allis-Chalmers HD-5G 1-yd. front-end shovels are making history... handling an endless variety of excavating and material handling jobs faster, at lower cost than ever before.

Now... to meet the challenge of everincreasing production demands, Allis-Chalmers multiplies the scope of tractor usefulness even more. And here's how. The same basic design — the same versatility that made the HD-5G so useful can now be yours in 2-yd., 3-yd., and 4-yd. Tracto-Shovels. Combined with the unmatched performance of the new Allis-Chalmers tractors, they give you a real competitive advantage by bringing you a new, faster and better way of getting the job done.

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- **Pioneering New Methods** Tracto-Shovels are blazing new trails in excavating and material handling . . . doing traditional jobs in a new, better way.
- A Size for Every Job Faster, more efficient operation; at lower equipment investment.
- All-'Round Versatility Not limited to a specific type of operation. Quickly interchangeable attachments adapt Tracto-Shovels to different assignments in minutes. Simple truck or trailer transportation between jobs.
- **Built to Take It** These new Tracto-Shovels are the toughest, strongest ever built. Every part has ample size and strength to do its job.

14 different attachments

Standard buckets, heavyStandard buckets, rock
duty rock buckets, blades,
forks, bulldozer buckets
light materials buckets
(up to 7 cu. yd.) . . . plus
other attachments for
some models.

yd. HD-5G

40 Drawbar hp.
Dumping height (bucket hinge pin): 9 ft., 1/2 in.
Total weight: 16,200 lb.

2 yd. HD-96

72 Drawbar hp.
Dumping height (bucket hinge pin): 11 ft., 4 in.
Total weight: 29,900 lb.

3 yd. HD-150

109 Drawbar hp.
Dumping height (bucket hinge pin): 12 ft., 8 in.
Total weight: 40,000 lb.

4 ya. HD-20G

Hydraulic torque converter drive 175 net engine hp.

Dumping height (buck hinge pin): 13 ft., 5 is Total weight: 61,600 lb. Advantages ... \*\*
YOW IN 3 NEW, BIGGER SIZES!

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bucket 1., 5 in 10 lb.



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who prefer to do their own drilling. Write for New Bulletin.

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#### CANADIAN LONGYEAR, LIMITED, NORTH BAY, ONTARIO, CANADA

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EPRESENTATIVES IN PRINCIPAL MINING CENTERS IN THE UNITED STATES AND OTHER COUNTRIES



• We give up... Without coal, the vital steel industry of today could not exist. Without steel, the enormous tonnage of coal needed by the steel industry could not be produced or delivered. Here is another example of the interdependence of two basic industries!

We can report this, however: The mines in Baltimore & Ohio territory are prepared and equipped to go right along with the steel industry in its expansion program. Too, there are millions of tons of untapped reserves of coking coals available for development.

These coals are available in varieties for all coking needs. They are easily accessible, and in plentiful supply for long-range planning. Whatever your requirements, let us advise you. Just ask our man!



BITUMINOUS COALS FOR EVERY PURPOSE



BALTIMORE & OHIO RAILROAD

Constantly doing things - better!

# A Forecast by MARION



### THIS NEW MARION 191-M..

.... is the world's biggest loading shovel—the biggest two-belt crawler shovel built. It is shown at work loading stone for a big construction project in Kansas. The 191-M has loaded up to 1,600 yards an hour in big 10-yard bites that fill trucks in the 50-ton class in 3 passes.

MARION predicts the 191-M will have a bright and busy future in mining. For many reasons, it will have important applications in all kinds of open pit mining. Some of the reasons:

- 10 Cu. Yd. Standard Shovel with 43' 8" Boom & 27' 4" Handle
- 7 Cu. Yd. Long Range Shovel with 65' Boom & 40' 4" Handle
- All-Electric or Diesel Electric Power, Ward-Leonard Control on Both
- An extremely Heavy-Duty Shovel with Small-Machine Cycle Time
- Greater Travel Speed and Maneuverability than most smaller machines

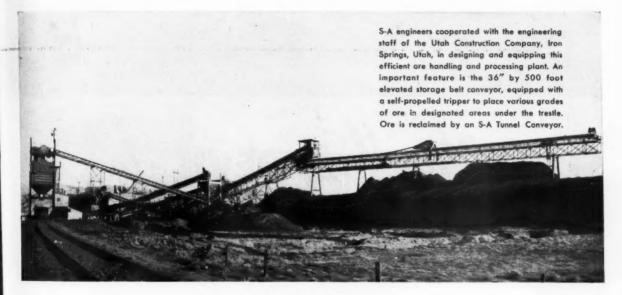
For more of the reasons, write, wire or phone Marion Power Shovel Co., Marion, Ohio.

Since 1884. Offices in all principal cities.



# CONVEYING Ustems

for distributing, segregating and reclaiming ore—
at LOW COST per TON



**Belt Trippers** Belt, Pan & Plate Feeders "AMSCO" Steel Pan Feeders Ship Loading Boom Conveyors Stacking Conveyors Storage & Reclaiming Systems Flight & Chain Conveyors Screw Conveyors
"Natural Frequency" Vibrating Conveyors **REDLER Conveyor-Elevators** ZIPPER Conveyor-Elevators Conveyor Belt Cleaners Headshaft Holdbacks Grizzlies & Screens Centrifugal Pilers Bin Gates & Tunnel Gates Car Pullers & Spotters Hoists & Winches **Bucket Elevators** SealMaster Ball Bearing Units

• Write for a bulletin on any of the above.

)hio.

Whether you need a highly specialized conveying-distribution system or simply more efficient ore handling at lower cost per ton—an S-A engineer can help you find the right method and the right equipment to do your job best.

In planning with you, he draws upon more than half a century of S-A experience. During that time, thousands of bulk handling problems have been solved—thousands of S-A installations engineered to meet widely varying requirements—some of them undoubtedly similar to yours.

S-A is equipped to meet ever-new demands—the most complete line of equipment assures you an unbiased recommendation. Write us for full details.

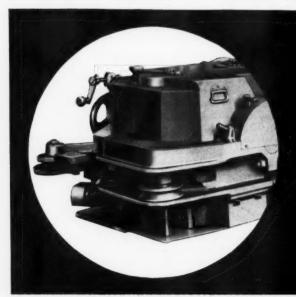
STEPHEN S-ADAMSON

52 Ridgeway Avenue, Aurora, Illinois

MFG. CO. Los Angeles, Calif., Belleville, Ontario



# SLACK Handling DEVICE for JEFFREY SHORTWALLS



This picture shows an application of the Device to a Jeffrey 35-B SHORTWALL Coal Cutter

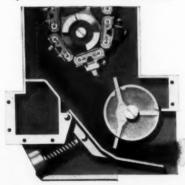
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#### THIS SLACK Handling DEVICE

- Discharges slack along the side of the cutter away from the kerf, assuring a better fall of coal.
- Eliminates cleaning kerf by manual labor.

The picture below illustrates its construction. Manganese steel paddles move the cuttings from the cutter chain to rear of machine by means of an eccentric movement.

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• Jeffrey 35 Series SHORTWALL Coal Cutters have had a wide acceptance in the field. Wellknown are such features as: Simplified operation, rugged construction, low maintenance and overall accessibility in making repairs.

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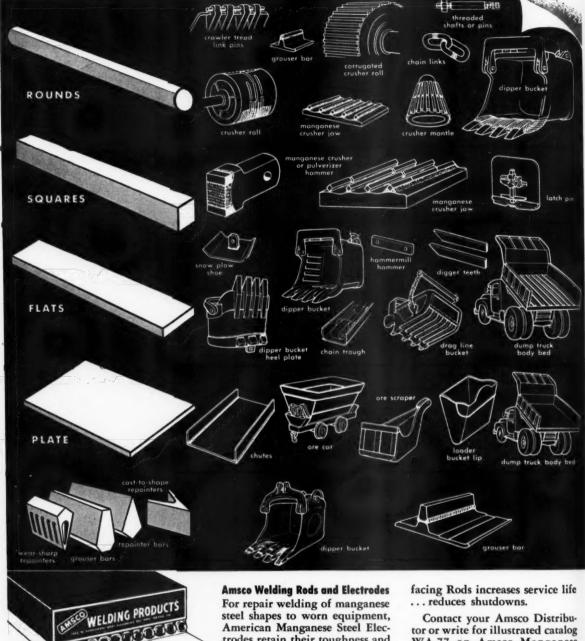


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#### In Congress, July 4, 1776

"THE UNANIMOUS DECLARATION of the thirteen united STATES OF AMERICA."

Thus was headed the document which has had such a profound effect on the destinies of this Nation and the world. This month the 176th anniversary of the adoption of the Declaration of Independence is being celebrated by Americans and their friends all over the globe.

We have been treading perilously close to paths that led the thirteen colonies to revolt. Only recently, but for a decision of a Supreme Court that still believes in the principles of the Declaration as they were later incorporated into the Constitution, we would have seen the right to security from seizure of property, without due process of law, disappear from the American scene.

The phrase "creeping socialism" has been used to describe the gradual infiltration of the idea that permanent government control of basic business processes is necessary. Since 1932 the government has continued to increase its activities, like a fibrous tumor in the body of American business. Its tendrils insidiously penetrate the tissues of industry under the guise of helping it over the rough spots. Once established, it feeds on its host, becoming ever stronger and bigger until what once was a hardly noticeable thread becomes a great malignant growth choking the very life out of the body it promised to support.

As with a tumor in the human body, drastic measures must be taken to tear out the roots of this bureaucratic parasite that afflicts America today.

Government is necessary, but it can endure only with the consent of the governed. The nation that is least governed, commensurate with the safety of its people, is the best governed. It is the right to manage their own affairs; to make a profit or fail according to their own abilities, in an atmosphere of freedom and equality of opportunity—in short a system of free enterprise, that has given our citizens the highest standard of living in the world today.

Many of the other principles that guided the authors of the Declaration of Independence also seem to be going by the board these days. For instance, does a man still have the right to work in whatever occupation and for whatever employer he wants to? Has he the right to join a labor organization if he wants to; or conversely, to refuse to join, if he sees fit?

For millions of Americans the answer to these two questions is "'no."

We are told that the right to strike is an exercise of the right to work or not according to the dictates of personal preference. But is it? How many of the hundreds of thousands of workers who are out on strike at this minute wouldn't return to work at once, to earn a living for themselves and their families, if they could do so without fear of reprisals—physical or social? Precious few, we'll warrant.

Again, the way we see it, freedom in a democracy means the right to work, think, and act as we see fit, as long as we do not hurt our fellow citizens or jeopardize the national security.

It is recognized that employes have the right to bargain collectively, in appropriate units, and the right to strike on behalf of their demands. But when a nationwide strike in a basic industry like steel is called at the behest of powerful labor leaders, and is prolonged over many weeks over the issue of compulsory unionism, it certainly jeopardizes the national safety and threatens the livelihood of millions of innocent workers outside that industry.

When such leaders have the power to shut down production across the length and breadth of the land, and when they use this power in the effort to impose a union shop and thus deprive the individual worker of his right to work unless he joins the union, the letter and spirit of the Declaration of Independence are being violated.

Are we, then, under the guise of paternalistic protection of pressure groups, to permit this abrogation of the principles on which our country was founded? Are we going to deliver our people up to this latter-day version of the type of tyranny that brought the thirteen colonies to open revolt 176 years ago?

The answer to this question must be an emphatic "no." Our citizens have not yet relinquished the right to think for themselves and they are doing just that. Among union members themselves there are an increasing number who question the methods, if not the motives, of their leaders. It remains for every one of us to rededicate himself to the principles that inspired those who framed the Declaration of Independence and the Constitution of the United States, to the end that every American may again enjoy equal rights to "life, liberty, and the pursuit of happiness."

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Ore travels by truck from open pit to primary crusher; by belt conveyor through the plant and to railroad cars

## Hazards of Truck and Conveyor Haulage

By W. R. WEBB and M. O. PETERSON
General Superintendent Personnel Director

Jones and Laughlin Ore Co. Benson Mines

SINCE the beginning of time, man has been constantly developing his means of conveyance.

It is interesting to look back upon the development of travel, even in the short span of our country's historythe long treks afoot, on horseback, and in covered wagons. It is difficult today, to appreciate the important roles played by the pony express, the stage coach, and the wood-burning "iron horses" of early railroading. The steamboat, the automobile, the modern steam engine, the airplane, diesel electric locomotives, ocean-going steamers, and ocean-spanning planes are all of recent origin and, of course, the jets. Beyond these what will be developed? We hesitate to imagine for we have learned that virtually nothing is impossible.

Each step forward was an answer to a better, quicker, and safer means of conveying materials and man from one place to another. Safety was one of the primary motives behind all this progress. While man's desire to do things more quickly, and with a minimum amount of effort, are important contributory factors, the desire for safety has been a major influence in each development.

The necessity for shotgun protection to guard the mail—a safety factor—brought the stage-coach to replace the pony express. The constant danger from Indians and hold-ups, hastened the days of the railroad. The safety of products enroute across the country brought faster trains. The safety of our country hastened the development of the airplane, and faster ocean-going liners, so that soldiers and materials could be moved quickly into action wherever they might be needed. The development of more efficient methods of propelling projectiles to an enemy has been in the interest of safety for our troops.

The evolution of the automobile has

# Training, Preventive Maintenance and Bonuses Promote Safe Practice at Benson Mines

followed a similar pattern. Increased speed demanded better highways, and safer riding qualities. Four-wheel brakes, better visibility, lower center of gravity, all safety features, are some of the automobile industry's developments to create a safer automobile.

The same trends have marked the development of materials handling in the mining industry.

Let's take a quick look backward to appreciate the tremendous changes that have taken place in comparatively few years. Pictures of early Benson Mines Pit operations show a high, old fashioned wood-fired steam shovel which required many hours of backaches to maintain its fuel supply. Small dinky engines pushed little dump cars on narrow gauge track from the shovel to the crusher. Crowbars, and sledges, must have been very important as mining tools. No pictures are available to show just what type conveyors were used in the plants. However, they certainly were not as efficient or satisfactory as those used today. Yet that was modern mining in 1917.

Today, we like to consider our operations as up-to-date, and believe

that the most modern equipment is used in our mines and plants. Safety has been an ever-present consideration in the design, construction and operation of our units.

Yet in spite of modern science and years of experience, man has not been able completely to eliminate hazards from his daily chore of living. He has learned to recognize these hazards. Experience has taught him that constant vigilance is required.

#### **Describe Operations**

Benson Mines is an open pit, hard rock, iron ore operation, located in northern New York. From early 1944 until January of this year only magnetite ore was mined and beneficiated.

In late January of this year plant facilities were expanded to include a gravity separation plant, employing Humphrey Spirals, to permit the utilization of martite. Magnetic plant recoveries were too low to justify treatment of this type of ore.

Mining operations include stripping of earth and barren waste rock, primary drilling and blasting, some secondary drilling and blasting to reduce large blocks to shovel and crusher size, loading with five-cu yd electric shovels, and truck haulage by 22-ton Euclid trucks to the coarse crushing plant.

Briefly, beneficiation consists of four stages of crushing followed by milling to reduce crude ore to concentrating size, magnetic separation to concentrate the magnetite ores, a gravity separation to concentrate the martite ores, and finally sintering to agglomerate the relatively fine concentrates.

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Approximately 650 men are currently employed. This number will be increased to about 700 when the present expansion program is completed.

In 1951 a total of about 1,600,000 tons of waste, and 2,900,000 tons of crude ore were hauled from the pit, and a total of 1,031,000 gross tons of concentrates were produced.

Truck haulage of large tonnages is not without hazard. To handle the 1951 Benson tonnage, trucks traveled over 500,000 miles. The under load ton-miles traveled totaled five and one-quarter million.

#### **Preventive Maintenance**

Hazards of truck haulage are directly related to the mechanical condition of the haulage units, the road system in use, and the training and judgment of the drivers. We believe that we have recognized the hazards involved and would like to present a brief summary of the practices we use to minimize the haulage risks.

Every truck is serviced once on each eight-hr shift. This service includes checking the tires, inspecting and tightening the wheel studs, check-

ing steering apparatus, lights, brakes, wipers, heaters, fire extinguishers, as well as refueling the truck. The servicing is done by the Garage Crew in a modern drive-through service bay of the garage, for quick and efficient service.

A record of service and inspection is maintained and signed by the checker. Drivers double check general operating condition of the truck, and are constantly on the alert for any indications of malfunctioning of the unit. Trucks are exchanged immediately, if any trouble is spotted before a unit is scheduled for its turn in the service bay.

The actual repair work and periodic overhauls are conducted in the repair section of the truck garage, where an overhead crane is available to handle the heavy unit assemblies.

The truck garage also serves as a repair shop for all mobile pit equipment including tractors, graders, air compressors, jackhammers, and, of

#### Safety Measures Taken

The importance of good roads and continuous road maintenance to minimize hazards to equipment and personnel cannot be passed over lightly. Considerable run-of-mine size waste rock is used as a base for our haulage roads. Waste rock crushed in our production crushing circuit is used to surface all roads. Approximately 75,000 tons of crushed rock is used annually for this purpose. Crushed ore is used to surface the roadways in the pits.

Since Benson operates 24-hr per day the year around, the hazards of night and winter driving must be recognized. Haulage roads are constructed sufficiently wide to permit caterpillar tractors to travel the edges and not cut up the surface the trucks will travel. Close side clearances are avoided to permit snow removal.

Road graders are used constantly the year around, to keep roads smooth.



Incentive payments keep truck accidents to a minimum

course, the miscellaneous service trucks required by the operation.

Locally-designed tire inflating stalls, dollies to handle assemblies, moveable working platforms and service pits for oil changing and understructure inspection and repair are among the features which are used to minimize the hazards involved in the maintenance of heavy equipment.

Road building and road maintenance to support heavy haulage equipment is a continuous job. The Benson ore body is comparatively narrow, but is about 2.5 miles long. Ore haulage, stripping, and access and service roads total about ten miles. Mining is currently being conducted in five general areas. Roads are continually being mined out, rebuilt or relocated.

The largest snow plow in the area is available to move any snow which exceeds grader depth. Rubber-tired dozers are used to remove snow from mining and parking areas. Calcium chloride is used, with or without sand, to eliminate winter traction difficulties.

In dry weather roads are water sprinkled to keep down the dust. Some calcium chloride is also used to settle dust in troublesome areas. A man patrols the roads to remove any rocks which fall from the trucks.

All roads are marked with Scotch light signs and markers, a practice which has been very helpful to drivers—especially when fog or snow limits visibility.

Traffic regulations are established

to permit safe haulage without production loss. Haulage trucks have the right-of-way over all other traffic, except the red trucks used by the blasting crew. Stop signs at intersections, and one-way traffic markers regulate pit traffic just as on the state highways.

#### **Drill Supply Hazards Great**

Other haulage problems are experienced by the trucks carrying water and bits to the churn drills. Because of the remote spots to which these trucks must go and the weight and clumsiness of the bits and drill stems delivered by them, this phase of operations has the poorest safety record of all pit occupations. However, the problem is not in the actual hauling, but rather in the handling of the materials delivered.

Air compressors of secondary drilling are all mounted on trucks to facilitate conveying the compressors, jackhammers (or wagon drills), where they are needed with the least amount of man handling possible. Mounting these compressors has eliminated many hazards for the jackhammer crews, to say nothing of the delays avoided in waiting for a "pull" by a truck or dozer which had to let some other job wait. Such delays very often held up the blasting crew.

#### **Bonus Aids Safety**

Dozers are a part of each loading crew. They keep the loading area cleaned, eliminating tire cuts resulting from driving over unseen rocks. This dozer is directed by a pitman, who also picks up smaller rocks and acts as the eyes for the truck drivers as they back into the loading area. All of these prevent little things, which could develop into major problems.

About one-third of the tonnage removed from the pit is waste. This operation is normally conducted on the day shift. All of the ore is usually hauled on the afternoon and night turns.

Ore hauling is on a bonus plan. This has helped safety in that the crews are careful to avoid anything which might cut down on their bonus or cause them to be taken off the ore hauling.

#### Training For Drivers

Benson Mines, located in a remote area in the Adirondack Park of New York State, found that skilled labor, was not available. Heavy truck hauling just wasn't known in this area. Consequently, it was necessary to assign an experienced driver to instruct truck driver applicants.

All truck drivers were required to take this instruction. More recently, with a stabilized crew, this instruction has not been quite so necessary, as truck drivers are broken in on the

smaller service trucks before advancing to the ore haulage and stripping units. All drivers break in on the stripping trucks before going to the ore haulage. The older first class truck drivers are now available as experienced instructors.

This took a lot of time, but has produced a group of good truck drivers. Truck and dozer crews from April 1948 through 1951 have had only one three-day lost time accident.

#### **Belt Conveyors in Mill**

From the time the crude ore goes through the primary crusher until it is dumped into the railroad cars as sinter, 45 belt conveyors are used. Total belt length is 13,700 ft or 2½ miles.

These belts vary in length and width from our new 1500-ft, 48-in. wide belt which carries the ore from the coarse crushing plant to the storage silos at the fine crushing plant, to the 24-in. belts in the concentrator and sinter plant.

Approximately 750 ft of conveyor belt is underground. This is a part of the new 48-in. belt which transports ore through a rock tunnel from the primary crushing plant on its way to fine crushing plant.

The hazards of conveyor belts are

Most conveyor belts are inclined and it is necessary to have fool-proof means of preventing the belt from rolling back if it stalls or is stopped for any reason. Switches operated by a pull cord from any point along the conveyor's length, give anyone near the conveyor a means of stopping it if necessary.

· All conveyors are interlocked to start in sequence, so that one can't overload the next one. The crushers are also controlled by the same system, so that they can't be started until the belts are going. All conveyors and auxiliary equipment in a system are started and stopped from a central control panel, equipped with indicating lights to show each piece of equipment operating.

#### Remedy Spillage, Buildup

Spillage of conveyed rock and the building up of sticky material on return idlers and in transfer hoppers are two of the leading hazards of conveyor operation. Freezing conditions in winter operation, of course, aggravate the build up problem. Both of these conditions, if not remedied, will damage costly conveyor belts. They may even cause a friction fire in extreme cases. While carefully designed loading points and skirt boards will reduce spillage; and belt scrapers will reduce roll build up, these conditions still require considerable attention. Alertness on the part of the conveyor attendant is required to prevent accidents in correcting these conditions. We have found that attendants must be repeatedly instructed to avoid the possibility of hernias or back injuries when shoveling spillage onto a belt. These men are required to wear safety shoes, as

(Continued on page 71)



Thirteen thousand ft of conveyor belt transport the ore through the plant at Benson Mines



Modern cleaning practices recover a greater percentage of fine coal

## Sampling and Screen Testing Fine Coal

A Report by the Surface Preparation Committee Outlining Methods Used for Determining Size Consists of Slurries in Coal Cleaning Plants

> T. W. GUY (Chairman), F. S. FERNEY, A. G. GILBERT GEO. E. KELLER, R. L. LLEWELLYN, J. J. MERLE

IN the following report the Surface Preparation Committee discusses some typical methods of sampling, testing and controlling the operation of fine coal circuits in modern wash-Such data are, of course, essential for quality control of products, for maximum recovery of merchantable coal, and for the most efficient and economical use of equipment, labor, supplies, power, water, etc. In addition, there is the increasing pressure to eliminate air and stream pollution. Some plants have carefully planned facilities for taking and testing good samples where needed from critical points in their circuits. Others have only crude facilities, or none. Where properly used, the investment required for the installation and use of such facilities brings an excellent return.

#### Importance of Sampling

In order to resolve the problem of sludge recovery and water clarification at a preparation plant, representative samples must be obtained to determine the proper equipment to be installed. It is necessary that extreme care be used in taking the sample. If the gross or head sample in error, the screen analysis will not be representative, and to take an additional sample may be impossible or require excessive time and expense. If certain principles as outlined in the following paragraphs are kept in

mind, the chance of obtaining a truly representative sample is greatly increased.

It is always desirable to sample the slurry while the coal and water is in motion. Stratification of coal in the stream is always a problem, but with proper care, a representative sample may be obtained. Sampling should be done when the plant is at or near equilibrium and it is of special importance that the operating conditions prevalent when the sample is taken should be noted. A screen analysis may be a true measure of the size distribution of the sample; but this size distribution may be worthless as a measure of the plant performance without information regarding the operating conditions under which the sample was taken. If a screen analvsis can be repeated within the limits of error of the operation, then the sampling and screening must necessarily be correct. If the screen analysis cannot be repeated, the whole process, from taking the sample through the splitting and screening procedures, should be reviewed for possible errors.

#### Sampling Procedure

Size of the sample to be taken is a question which can be answered only by experience. As a general rule the smallest representative sample is the best; for wet screening a large sample is tedious and time consuming. One company keeps its sample of coarse coal down to a maximum of three gal, and of fine coal slurries to

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A well-equipped laboratory is essential for proper preparation control

a size which gives a minimum of 300 grams of solids. On the other hand, another company takes sample increments at regular intervals during the operating day; not less than 14 increments are taken in one seven-hour shift. A cutter can is the sampling device used. (See Section 19, page 3, Taggarts Hand Book of Ore Dressing 1945 Ed.).

The entire stream is always cut when taking samples. If facilities are not available, they can be made available at relatively little expense. Usually this means the installation of by-pass lines and valves when the material is being conveyed by pipeline. Thus the entire stream can be diverted while the sample is being taken. The same method is used in the case of an inaccessible launder; a by-pass is arranged to divert all of the stream to a receiving hopper. The line is equipped with a valve or valves as necessary.

In sampling relatively coarse suspensions, say ¼-in. by 0 material coming from a table, it is often quite difficult to get a truly representative sample. This is because samples have to be taken from relatively large streams of material where the entire stream cannot be diverted into a container. In such cases the best procedure is to obtain a number of small samples to represent as nearly as practicable the normal flow and then to wet screen the total of the small increments.

Solid or cake samples, such as the discharge from a filter, the overflow from a shaker screen, the chain product from a sludge tank, and a vacuum filter cake, should be taken in relatively large quantities and then split in the conventional manner using a riffle box. For a final screen sample one quart of, say, 600 to 900 grams, wet weight, would be satisfactory. In the case of solids discharge from a filter, a sample will,

in most instances, be obtainable from a belt passing underneath the machine, a drag conveyor or the like. In obtaining a solids sample, from this type of equipment, it should be remembered that some size grading has taken place in the machine itself. In other words, there is a tendency to discharge the coarse product onto one section of the conveyor and finer particles on another section. This grading is not great enough to be visually observed, but a better sample will be

process should take about 30 seconds. Several samples may be taken at one time and, if all operations are performed correctly, should give the same screen analysis within the limits of experimental error.

Granular samples, such as raw coal feeds, filter cakes, dewatering screen cakes, etc., are treated in a different manner at the laboratory. If the sample is dry, it can be split by a standard sample riffler until a sample small enough to wet screen is obtained. Samples that are wet when received, are diluted with water until a mixture that can be stirred easily is obtained; it is then split in the manner described in the preceding paragraph.

#### Dry Screening

There are two common methods used today by laboratories for making screen analyses of the solids in washery water. One is to decant the excess water and dry the sample in an oven, after which the solids are sized in a Ro-tap screen and each increment weighed. The other method is to wet screen the solids through the various size meshes and then dry before weighing. Table 1 clearly indicates the variation between the two methods of testing and it is suggested that the Committee should develop and recommend an approved testing procedure so that future data will have a

TABLE 1—SIZE CONSIST TESTS BY WET AND DRY SCREENING Submitted by R. L. Llewellyn

	MINE A		MIN	Е В
	Dry Screening	Wet Screening	Dry Screening	Wet Screenin
Plus 28M	23.9%	16.0%	11.2%	9.0%
	22.4	16.0	29.0	15.0
28 x 48M	$\frac{22.4}{25.2}$	13.0	29.0 27.9	17.0
100 x 200M		10.5	12.7	15.0
200M x 0		44.5	19.2	44.0
	100.0	100.0	100.0	100.0

obtained by collecting it over the full width of the belt. Occasionally there will also be a mass of coal discharged which has hung up, and this more often than not may be substantially finer than the normal discharge.

#### Splitting the Sample

The size of sample taken at the plant may vary from more than 50 gal to one gal or less. At one laboratory, samples which are wet when received,—circulating water, cyclone products, plant bleeds, filter feeds, screen feeds and effluents—are placed in a large tank and circulated and stirred by means of a pump and auxiliary piping. Samples obtained by valves in the discharge line from the pump may be degraded in this manner, but the danger may be kept to a minimum if the sample is taken as soon as the slurry is well stirred. The

common basis which can not be misinterpreted.

Since it is the minus 200-mesh material which tends to agglomerate on drying and, therefore, cannot accurately be dry-screened, the method suggested by one company is to eliminate the minus 200-mesh fraction from the sample by wet screening. The plus 200 mesh fraction can then be dried and screened in the usual manner without endangering accuracy of results. The specific procedure is as follows: A standard 200 mesh screen is placed in a basin or pail. A length of laboratory rubber tubing is attached to the water faucet and pinked with a C-clamp to make a spray effect. Water pressure should be kept low to prevent splashing over the sides of the screen but with just enough volume to keep the solids on the screen moving

around. A small portion of the total sample is then poured onto the screen and washed until the wash water goes through easily. The end point for this portion is reached when there is no longer evidence of 200-mesh material being washed through the screen. This procedure is repeated until the entire sample has been washed. It is not usually necesary to add a wetting agent unless the product has been dried or unless a brand new screen is used.

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The minus 200-mesh material that has been collected in a receiver below the screen can be poured into Buechner funnels and filtered clear. filtered solids can then be dried and weighed. The plus 200-mesh material, washed free of minus 200-mesh particles, is dried and weighed-an infrared lamp is quite useful in dry-This portion of the sample is then ready for dry screening, usually in a series of screens of such sizes as may be desired. A total screening period of the coarse material in a Rotap for ten minutes is usually sufficient. If the wet screening has been done thoroughly, there should be not more than a few grams of minus 200mesh material.

#### Wet Screening

Some companies advocate wet screening the entire sample and one company reports that they are unable to check results when using dryscreening methods on sludge. can, however, check closely with wetsieving methods. The difference in results obtained by the two methods (See Table 2) will vary directly with decrease in particle size and percentage of clay in the sample. Such differences in a 4-in, by 0 coal containing only a little clay will not be outstanding with either method, but there will be a wide difference in results with a sludge that contains a high percentage of clay. For example, the dry and wet screening tests on Dorothy Seam, %-in. coal in Table 3 were made to show effect of disintegration of the shale in this seam. The "Dry Screened" test was made in the regular ASTM manner except that Gilson and Ro-tap were used. The "Wet Screened" test was made by first soaking the sample for 15 minutes in water and then screening. The amount of spray water was kept to a minimum since the shale or draw slate seemed to continue to disintegrate as long as sprayed with water. After screening, the fractions were dried and rescreened.

There is no set rule regarding the top size of a sample that should be wet screened. It has been found, however, that analyses can be duplicated consistently on % in. by 0 when the screening is done wet. On a dry basis, the analysis is somewhat er-

TABLE 2—CHECK ANALYSES USING WET AND DRY SCREENING Submitted by J. J. Merle

	Dry Screening	Wet Screening
Plus 8M	. 4.4%	3.0%
8 x 30M	. 18.2	13.2
30 x 50M		12.0
50 x 100M		10.8
100 x 200M		6.7
200 x 325M		5.3
325M x 0*		49.0
	100.0	100.0

\*Note: The 325M material and water was discarded and its percentage calculated by subtraction. It was found to check within 1% and this method is believed sufficiently accurate for routine work.

ratic. In the determination of a size distribution of such a sample, a stack of from 6 to 12 screens are generally used.

Each screen is washed continuously, moving the coal across the screen with the spray until an examination of the "through" water reveals no solids. water reveals no solids. Solids can be made to pass through the sieve by gently rubbing them by hand and by imparting a shaking motion to the sieve as in conventional hand-sieving. Each screen is checked by removing the screen and catching a sample of the effluent. When the effluent is clear, the screen is removed and work is begun on the next smaller When all screens have been screen. thoroughly washed and the underflow from the last screen contains no solid material, the screens are restacked and air dried in an oven of 110° C

for two hours. The final screen effluent (water and 325 mesh material) is filtered in a Buechner type funnel and the filter cake is placed on a pan and air dried as above.

After the screens are dried, they are placed on a Ro-tap and screened from 5 to 20 minutes. The undersize is added to the filter cake. When the wet screening has been done properly the additional undersize from the dry screening is less than one percent of the total undersize material in the sample. After the sample is dry screened, each size is weighed separately. Figure 1 shows curves comparing results of wet and dry screening of three samples.

In wet screening, the quantity of water used varies considerably, ranging between one pint and one quart per minute. Good efficient screening.

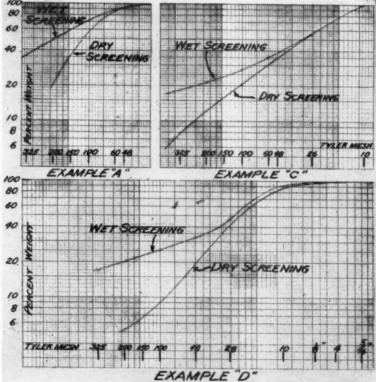


Fig. 1—Curves comparing results of wet and dry cleaning

TABLE 3—WET AND DRY SCREEN TESTS ON DOROTHY COAL Submitted by Geo. F. Keller

			Dry Screening	Wet Screening
34	in. x	4M	32.9%	30.3%
4	X	8M	99 0	22.6
S	X	14M	. 15.4	16.5
14	x	28M	. 12.5	10.4
28	x	48M	. 6.9	6.1
48	x	100M	. 3.6	3.8
100	x	200M	. 2.3	2.6
200	x	0	. 3.5	7.7

using six sieves, can be accomplished in approximately 20 to 30 minutes. Two gal of water are usually required to wet-sieve to 60 mesh. An additional 11 gal are required to wetsieve through 325 M. A wetting agent will facilitate screening of material finer than 100 mesh if it contains argillaceous material.

#### Summary

The foregoing discussion outlines typical methods of making dry and wet screen analyses. However, it may be possible to combine the two. One company, to reduce work in wet screening the minus 10 mesh, proposes first to dry screen on 10 mesh and then wash the fine coal from the plus product. This fine material will be recovered, dried and added to the 10 M by 0. The total minus 10 mesh will be reduced in quantity and then dry screened on 28, 100 and 200 mesh. The same coal will be then wet screened (except the 200 M by 0) and after drying will be re-screened dry the second time.

In certain cases it may be of value to know the nature of the minus 200 or minus 325 mesh fraction; that is, whether these fines are made up of all coal or coal plus a collodial clay. This can be determined microscopically, at least qualitatively. If a quantitative size analysis of the fine fraction is desired, elaborate laboratory technique and apparatus is necessary, and

the matter should be referred to a commercial laboratory equipped and staffed to do this type of work. It might be mentioned that the difficulty with sedimentation methods in deter-

#### **Volume and Tonnage** Determination

At times it is desired to determine the volume of water and the percentage of solids in the slurry flow. This can be done in two ways. For small volumes the entire product, water and solids, is diverted to a container large enough so that it can be timed for several seconds by an accurate stopwatch. The rate of flow and weight of solids is determined by actual measurement. A 52-gal oil drum is suitable for this purpose.

For large volumes, the capacity of feed sump to pump is first determined. Then by diverting or stopping the flow to the sump, the time required for the



Refuse that was formerly wasted is now being reclaimed

mining particle size of these slurries lies in the fact that there is considerable variation in the composition of the solids, screened from samples coming from different sources. Here again judgment is required.

pump to empty the level-full sump is recorded by stopwatch. From the data obtained, including representative samples taken with a cutter can. the flow of water and solids and the tonnage of solids can be ascertained.



A sludge pond is the final step in preventing stream pollution

## Roof Bolting at the United States and Lark Mine

Experimental Installations Under Difficult Conditions
Proved Adaptability and Yielded Savings in First Cost
and Maintenance

By BENTON BOYD

Superintendent, Lark Section United States Smelting Refining and Mining Co.

IN an effort to take advantage of the benefits of roof bolting, the U.S. and Lark Mine of the United States Smelting Refining and Mining Co. instituted experiments in roof bolting during 1950. The advantages of roof bolting are numerous. If the practice is applicable to any extent, one important advantage is reduced costs. Other advantages are less timber maintenance, improved ventilation, reduced waste handling and fewer fire hazards. The purpose of the experiments was to prove the adaptability of roof bolting, and to determine possible cost savings.

#### **Favorable Spots Chosen**

Experimenting has been done on a limited basis. The ground at both sections of the mine is not sufficiently uniform to permit wholesale roof bolting. Choice of places to begin bolting was based on the reported experience of other operators to insure selection of favorable locations. The roof bolting program was carried out on a diversified scale. Results have justified even wider application. All tests are under close supervision. Failure of bolts is readily detected. In addition to maintaining accurate records, close supervision was provided in order to train crews properly to place and install bolts.

The bolt used at the U.S. and Lark Mine is the one-in., split-rod type, in four, five and six-ft lengths, with wedge, hex nut and % by %-in. plate. Both stoper machines and jacklegmounted jackhammers have been used for the drilling of holes and wedging of the bolt. One and threeeighths-in, tungsten carbide bits and 17/16-in, steel bits are used for drilling the holes. Dollies for the pneumatic machines were made in the mine shops for the seating of the wedge. A heavy duty, air-impact wrench is used for tightening the nut. This machine provides the uniform tension which is so essential.

For proper installation, depth of hole is of major importance. Shallow holes can be easily remedied; overdrilling is troublesome. Usefulness of the bolt depends upon proper seating of the wedge at bottom of the hole. In order to remedy over-drilling, if a hole is drilled too deep, scrap leynersteel is cut in short lengths and placed

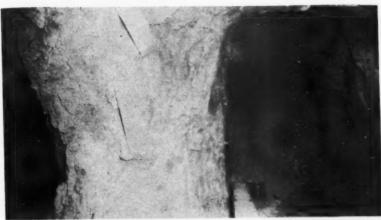
in the bottom of the hole to take up slack. To obtain maximum benefit of the roof bolt, full bearing of the plate is necessary. For holes having diagonal collars small pieces of angle iron are installed ahead of the nut. If bolt is to be placed for permanent installation, scrap pieces of steel should be used where shimming is necessary.

#### Geology Causes Problems

A brief description of the geology of the mine is necessary to better appreciate the problem in roof bolting. The sedimentary column, composed of alternating limestone and quartzites, in the Bingham District is folded into an asymmetrical syncline whose axis is pitching to the northwest and intruded by the Utah Copper stock and



Bolts and gunite made this transformer room safe until concrete could be placed



A six-ft pillar was maintained in fractured quartitie while driving run-around drift

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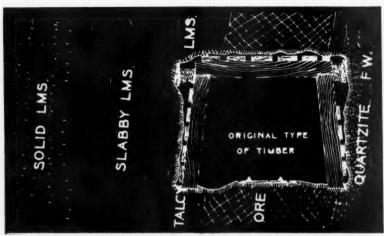
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In U. S. Section drifts, bolts into slabby limestone prevented movement which formerly crushed jacket-sets

associated intrusives, which are the probable sources of commercial mineralization in the district. Ore bodies occur as fissures and as limestone replacements. The westerly or U. S. section of the U. S. and Lark Mine lies on the steeply dipping southwesterly limb of the syncline. The easterly or Lark Section lies on the gently northeasterly limb.

At Lark Section the major ore pro-ducing structure is the Lark Vein, in conjunction with the Lark limestone. The limestone dips 23° northwesterly and varies in thickness from inches to 30 ft, averaging eight to ten ft. Ore replacement normally occurs on the footwall and is seldom complete, leaving a soft black lime hanging wall of varying thickness. The hanging wall of the limestone is a fairly uniform, bedded quartzite which in many cases is fractured and loose. All stoping operations and most drifts require immediate timbering. Timbering of stopes is needed to prevent sloughing, primarily. As stoping advances considerable weight is thrown on the timbers. Stope filling is required to prevent caving which jeopardizes recovery of remaining ore.

#### **Intersections Bolted First**

The first locations at Lark Section chosen for bolting were intersections where immediate timber was not re-These intersections required cover after exposure. Spalling is an indication that timber is needed. In a typical intersection, only one section required immediate timber. The excavation beyond the timbered section was 15 ft wide and ten ft high for a length of 30 ft beyond where the opening reduced to normal drift size. After a period of one year this enlarged area was bolted. The drift section was left unbolted and untimbered. Recently the drift section required timber. The bolted section

still shows no evidence of failure. This is one of many examples where bolting of old openings has proved successful.

Where an intersection was opened to a width of 28 ft in loose, fractured quartzite, roof bolts with four by eight-in. headboards, two ft long, were used to support the ground. These bolts with headboards firmly supported the opening until the entire area was gunited. The excavation was completed without the use of timber.

In the construction of electrical stations, such as battery-charging stations and transformer rooms, where fire hazards must be eliminated, roof bolting has replaced timber. These stations must be located at specific points on the level and the choice of ground conditions is limited. In

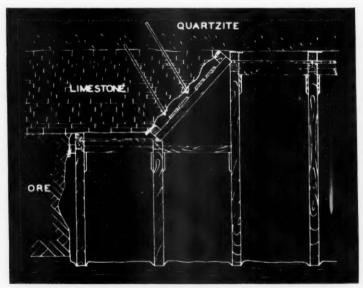
places where the ground was loose, four by eight-in. headboards, two ft long, were used. Where new stations could not be cut, the back and sides of old excavations were bolted while the timber was in place. After bolting was completed the timber was removed.

A transformer room 20 ft wide by 15 ft high by 32 ft long was excavated in hard but slabby ground. In order to make the working place safe until concrete would be placed, the room was completely roof-bolted and then gunited. As excavation advanced bolts were placed from the muck pile. This safety procedure avoided the necessity of carrying timber too close to the face.

#### Help Prevent Outbreak

Collaring of openings in open ground presents the problem of overbreak. This problem has been reduced to a minimum by the use of roof bolts. At the Lark Shaft a runaround drift was recently required. The ground is a loose fractured quartzite. A minimum six-ft pillar was specified. The face of the pillor was bolted. As the run-around drift advanced the inner rib was thoroughly bolted. Where necessary, headboards were used. Surprisingly, the pillar was maintained and was gunited after blasting was completed.

In many cases of collaring crosscuts from the vein, considerable timber is required once the hanging wall is broken. Bolting of the brow before blasting reduces the amount of timbering needed. Collaring of raises provides an exceptional example of this application of bolting. The collaring of the hanging wall station of



In Lark Section stope, bolts in limestone temporarily prevented caving but tremendous weight caused failure of both bolts and timber



Roof bolts with four by eight-in, head boards successfully held 28 ft wide opening in fractured quartzite

a three-compartment, 25° incline presented the problem of maintaining a brow of ground between the back of the incline and the floor of the station. Two rows of roof bolts at 33-in. centers and 48 in. between rows were placed in the back of the incline immediately below the station. Five-ft bolts were used on the upper row and six-ft bolts on the lower. A full brow was maintained.

#### **Negative Result in Stopes**

Roof bolting of stopes presented another problem. Supporting of the replaced limestone above the ore is difficult and costly. Rate of mining is fast and although waste filling follows closely, in many cases caving takes place before filling can be completed. The stoping method is locally termed longwalling and differs from coal mining meaning of the term in that the wall, six ft wide, extends from level to level. As the longwall cut advances, timber is installed. As an experiment a 90-ft section of longwall was left untimbered and 40 roof bolts were installed in the hanging wall. When roof bolt-ing was completed, timber was installed. After stoping of the next longwall cut was nearly completed, a portion of the bolted and timbered section caved. Stoping ceased until waste filling was completed. The entire section produced tremendous weight, causing both timber and bolts

In many stopes, width of ore varies considerably. The overhang requires cribbing. An attempt was made to

eliminate the cribbing by placing 34 roof bolts in conjunction with timber. The adjacent longwall lane was completed and the second lane had progressed to the bolted area when the overhang brow collapsed, caving the stope. A badly-shattered hanging wall condition could not be detected prior to caving. In these instances of stope bolting results were negative.

#### **U. S. Section Ground Blocky**

U. S. Section ground conditions are more troublesome than at Lark Section. Average dip of ore bodies is 70°. Fissures are actually fault zones. Faulting has disturbed the wall rock. Fissures generally occur in porphyry, which is often swelling and heavy. This makes mining difficult and costly. Normally the limestone hanging wall of the replacement bodies is considerably shattered and broken, causing heavy sloughing. All stopes and most drifts are heavily timbered and maintenance is costly.

Blocky ground is typical in both limestone and porphyries. Intersections cut in very hard ground often require immediate cover for protection from sloughing. Present practice is to bolt these intersections as soon as they are opened. Bolts are not placed in a definite pattern, but are used to support overhanging slabs and brows. Drilling for roof bolts must be done with caution as the back is often loose. A temporary stull is usually sufficient protection. Many new, as well as old, intersections have been roof bolted. To date, results are encouraging.

#### **Drifts and Raises Bolted**

Considerable roof bolting of drifts has been done, in most cases, as soon as the drift is opened. On the footwall of a heavy limestone with shatered hanging wall, it was formerly necessary to start timber repairs approximately three months after the section was opened. After timber sets had been replaced twice, roof bolts were installed. A year later the drift was still in good condition and needed no repairs.

Some ore-raises in porphyry are exceptionally heavy. Timber squeezes shortly after installation. As an experiment, roof bolts were installed with regular timber, four bolts being placed in each six-ft set. Results have been favorable. Bolted sections show much less timber squeeze than unbolted sections.

These experiments have covered an 18-month period. During that time a total of more than 1500 bolts were installed. The average number of bolts installed per manshift is five. This average includes the training period and the time required to move equipment. It must be remembered

(Continued on page 47)



In typical intersection bolted area showed no failure while unbolted section required timbering

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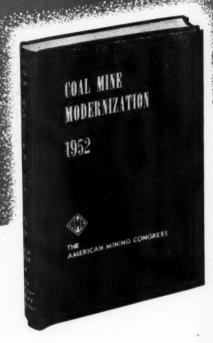
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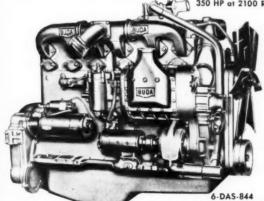
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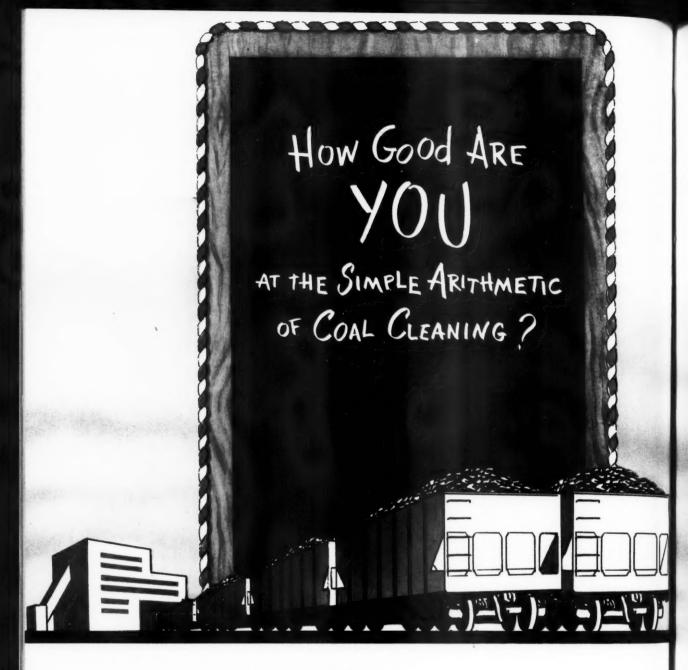
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- Q. If a mine cuts, loads, hauls and cleans coal for \$5.15 per ton and receives \$6.00 per ton at the mine, what increase in gross profit would that mine have if the cleaners recovered 2½% more shipping-grade coal from the same feed?
- A. 17.65%.

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Roads can be constructed to withstand the rigors of a hard winter

## Some Considerations in Truck Road Construction

Improved Roads Increased Production 26 Percent Last Winter Over Previous Winters at the Central Indiana Coal Co.

By S. F. SHERWOOD

THE Maid Marion Mine of the Central Indiana Coal Co. was opened in 1948. Company officials were never entirely pleased with the haulage road at the strip mine but considered them fairly satisfactory and as good as the materials at hand would permit. Roads were constructed with a sub-base of shale, shot from the highwall, laid on the sub-grade to a depth of three ft, and then compacted with a tractor and roller. On top of this was placed eight to 12 in. of crushed rock. "Red dog" from abandoned gob piles, which had been found satisfactory at other company mines in Greene and Sullivan Counties, Indiana, was not available.

#### Roads Failed

Until the winter of 1950-51, the average amount of raw coal hauled during January, February and March was 3000 tons per shift with a 24-mile haul from pit to tipple. From

January to March, 1951, this average dropped to 2300 tons per shift over the same distance. The weather was particularly severe and during several thaws the road went to pieces. It peeled off in layers at the points where ice in the sub-base had destroyed the bond, and, as complete melting of the frost took place, the road turned into a sea of mud. County roads were just as bad and there were several days when only those who lived within walking distance of the mine could get to work. Fortunately, the section of the road that was worst hit by this condition was the section that the company expected to abandon before the next winter.

During the spring thaw it was observed that the "temporary" roadway in certain sections of the pit itself, where stripping was not actually under way, fared much better than the permanent pit roads. These temporary sections were built by using the

fire clay; placed to a depth of from three to four ft to form a raised roadway which was packed and leveled with a bulldozer as it was placed. No surface metal was used and during rainy weather a bulldozer planed off one or two in. of the top, leaving a reasonably dry surface over which to haul. This indicated that the fire clay was fairly impervious to water penetration and it was decided to use a fire clay sub-base for the next permanent truck road instead of the high-wall shale.

#### **New Methods Studied**

In the spring of 1951 it became necessary to build an additional 4000 ft of truck road to enter a new section of the pit. This was built by first grading a 50-ft roadway, well ditched on either side, then scarifying the subgrade with a road patrol and re-compacting with a sheepsfoot roller. Fire clay was then applied in six-in. lifts and compacted with the same roller; sprinkling with water when necessary to get maximum compaction; The fire clay was built up to a thickness of 18 in. Then three lifts of 11/2-in. by 0 crusher-run limestone were laid, 30 ft wide, with a six-in, crown to a thickness of four-in. after compaction. Each lift was packed separately with the roller until the sheepsfoot showed practically no penetration. The surface of the limestone was then topped with two in. of one-in. by 0 river gravel for maintenance.

After starting construction on this road, the engineers became apprehensive as to whether they had selected the best material available for a sub-base. Messrs. W. H. Goetz and E. J. Yoder from the Civil Engineering Department of Purdue University were employed to investigate the suitability of all the available road materials at the mine. They came to the mine and took samples of various materials which in their opinion were suitable for truck road construction. Unfortunately, the time required to analyze the materials was longer than could be afforded at the time, however the company did benefit a lot from their report and was able to incorporate some of the recommendations in constructing a portion of the. road.

In addition to this section of new road, the surface of 11/2 mile of old road leading to the tipple was scarified and rebuilt in accordance with Goetz and Yoder recommendations for flexible pavement thickness and compaction to obtain maximum density. Overall result of the new construction was an improvement in haulage conditions to the extent of increasing the average coal tonnage during the three month period of January, February and March from 2300 tons per shift in 1951 to 3780 tons per shift in 1952. The same number of trucks were hauling the same distance. Weather conditions during the winter of 1951-52 were less severe than during 1950-51, nevertheless the average raw coal tonnage was increased approximately 26 percent over previous winter months when weather conditions were nor-

#### **Purdue Tests and Analysis**

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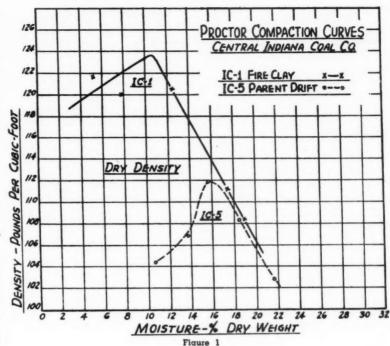
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The investigation made by Messrs. Goetz and Yoder consisted of a number of analyses of shale, fire clay, and a clay silt found 12 to 18 in. below the grass roots, which they classified as parent drift. The four most important analyses they made are described in the following.

First was the test on grain size. The grains of the fire clay and parent drift were not too dissimilar. Observation as well as tests showed that the shale as loaded from the pit did not have the proper ratio of sizes to insure the filling of all the voids between particles even with extreme measures in compacting and rolling. This condition of course permits water penetration and is an insurmountable objection to the use of that particular shale as a sub-base. Therefore, in further tests the shale was omitted.

The second test was that of maxinum density under a standard technique of compaction. The upper curve in Figure I one shows the dry density



of the fire clay in pounds per cu ft on the vertical scale against percent moisture to dry weight on the horizontal scale. Of course, maximum density is desired as it means less voids for water penetration. curve is sharp at maximum density. The practical application of this information is to see that the material being compacted as a subgrade is at the optimum percent of moisture. If this material is too low in moisture it should be sprinkled before rolling and if the moisture content is too high it should be allowed to dry. A few percentage points plus or minus from the optimum can mean a lot in the

RESULTS OF FREEZE - THAW TESTS

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TWO CYCLES

Figure 2

effectiveness of compaction. If the moisture content is off, no amount of rolling with a sheepsfoot will bring it to the maximum possible density.

#### Freeze-Thaw Tests

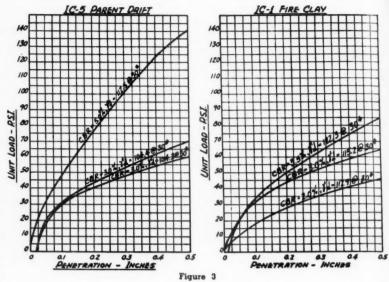
The third test was that of freezethaw. Three samples of the fire clay and three samples of the parent drift were compacted to maximum density in cylinders two in, in diameter and 41/2 in. high. The test consists of freezing a sample at 26° F for 24 hours and then thawing it for 24 hours; letting the sample sit on a porous dish placed in water enabling the material to take up water during the thawing period. Before starting the freeze test one set of the samples was placed in unconfined compression and the maximum strength be-fore disintegration of the cylinder noted. A second pair was put through two cycles of freeze and thaw with the maximum compressive strength noted in each case. Results of this test are shown in Figure 2. The parent drift was superior as it took almost twice as much load as the fire clay after four cycles of freeze and thaw. The amount of moisture absorbed by the fire clay sample was almost double by the time it reached the fourth cycle while in the parent drift sample the increased absorption amounted to only 62 percent.

As soon as freezing occurs, the initial ice crystals draw free moisture which in turn freeze, forming ice lenses. This phenomenon repeats itself as the frost penetrates deeper and deeper during a cold winter. These

ice lenses separate the road material into unconnected layers. Then when a thaw comes in the spring, melting occurs at the top, and since the ground is still frozen underneath, there is no drainage. If the material is sticky it will adhere to truck tires, and peel off in layers, creating a soft muddy condition on the surface of the road. The mud becomes progressively deeper as the thaw continues. This is what happened to the shale subbase of the roads in the Maid Marian Mine during the spring of 1951.

#### **Bearing Ratio Tests**

The fourth test is known as the California Bearing Ratio Test. This test is described by Messrs Goetz and Yoder as: "An arbitrary test adopted by the Corps of Engineers, U. S. Army, and many other agencies for the purpose of determining the re-quired thickness of a flexible pavement. The test is made by penetrating a sample of soil with a piston of a standard dimension at a standard rate. Specimens are allowed to soak in water for four days before the penetration test is made. This is done so that the soil will be in a weak state before testing, corresponding to conditions encountered in the spring of the year. The bearing ratio is then calculated as the percent of the unit load on the piston at a given penetration to that of a standard load obtained from testing a good grade of crushed stone. The C. B. R. (California Bearing Ratio) is then used in conjunction with design curves (obtained from field performance surveys and accelerated traffic tests) to determine the required flexible pavement thickness for any wheel load." Materials for this test at Maid Marian were formed into cylindrical samples



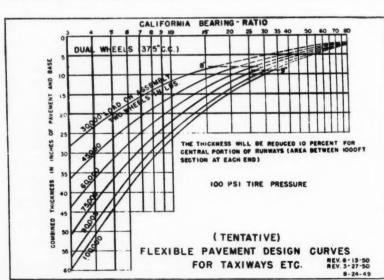
about six in. in diameter. The piston used for penetration had an end area of two sq in. Samples were held in a form with a 30 lb weight resting on the top of the material, completely covering the surface except for a hole to admit the piston. The 30 lb is to approximate the weight of a top layer of rock on the road.

Best results with each material are obtained when the sample is at the maximum density. The parent drift, at maximum density, is five percent of a standard crushed rock sample while the best fire clay can do is 3.5 percent. Compacting the parent drift to a maximum density is a critical factor.

A design curve (Figure 3) obtained from field performance surveys and accelerated traffic tests has been worked out by the Army for taxi ways at air fields, and best approximates the type of use given roads by heavy haulage trucks. As an example of the use of this chart, assume a 30,000lb wheel loading which would approximate a 30-ton haulage unit. Using a sub-grade material having a C. B. R. of five percent, the chart shows that it would require a minimum of 20 in. of flexible pavement materials to properly distribute the load to the subgrade. It indicates, too, that at least eight-in, of crushed rock is needed as top dressing. This means that at least 12 in. (20 minus 8) of sub-base material must be placed between the crushed rock and the subgrade of five percent C. B. R. The chart also shows that with the given loading of 30,000 lb the material for the 12-in. sub-base must have a C.B.R. of 17 percent. Such a material might be bank gravel with proper size consist running down to sand and clay particles to give it good compaction and density.

The chart was worked out assuming almost flood conditions on an air field. In other words, the chart designs a pavement for maximum safety and permanency. A coal haulage road, except near the preparation plant hopper, will probably have a relatively short life, and with good maintenance and proper drainage care, these maximum requirements could be reduced. However, the chart will show how much a roadway fails to meet the ideal road specifications. It is well to know the degree of danger of road failure so that all measures within means can be taken to correct it. This is better than to be lulled into a false sense of security by looking at a well graded rock sur-

(Continued on page 73)



The California Bearing Test Ratio indicates that paving material will be penetrated least when it is at maximum density



Without a Gold Standard a large proportion of Federal Funds come out of thin air

"I DON'T know what a Gold Standard means, and I don't believe anyone else does!" yawns the man in the street.

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Yet American democracy will fail its sovereign duty and invite disaster unless it masters the A-B-C's of a Gold Standard for money and its bearing on the economy. After all, there is no mystery about these matters and, freed from technicalities, there is no reason why their essentials cannot be understood. Perhaps the explanation of the head-shaking when someone mentions gold as a standard for money is because most of us have never grasped the real meaning of money. We like the funny stuff (and will grasp it) but we have scarcely bothered to think what it really is.

#### What Is Money?

Money is a symbol of value. It can be represented by a coin, a bill, a certificate promising to pay, a deposit in a bank, or any customary medium of exchange.

Now, what is Value? (Ay, there's the rub!)

Value is the true worth (purchasing power) of anything in terms of anything else. If two or three boys are trading blueberries for jacknives, and in such a free market it turns out that one jacknife will buy four quarts of blueberries, then the value of four quarts of blueberries is one jacknife—and vice versa.

Every commodity (and every service) has its value and usually its price in money; but if money is to reflect

## "G" Stands for Gold

Here is a Strong Plea for Sound Money Expressed in Plain Terms

By LEWIS P. MANSFIELD

Stephenson & Mansfield San Francisco, Calif.

true value, that money has to be tied to true value itself. It is not a good symbol merely because it is a legal one but it must be identified with value. Indeed, how could it serve as an enduring measure in human transactions if it were only "as sounding brass"—and hence meaningless.

Now, what is a commodity? A commodity is something which we can see or touch and which has utility in itself—an apple, a pound of lead, a piano, a parcel of real estate, an ounce of gold. Certainly gold is a commodity for it can be apprehended by the senses and it is useful in many ways. Gold was a commodity before it was employed as money.

#### Values of Gold are Many

Moreover, gold has a unique place in the regard of human beings which stems from its great beauty and utility as a precious metal. The age-old yearning for gold is not a supernatural aspiration but a rational one. Gold enjoys an almost ideal combination of qualities. It is among other things durable, malleable, ductile, portable, divisible, homogeneous, beautiful and scarce. No other commodity has proved so convenient as a gauge for the valuation of all other commodities -and services, which might be called first cousins of commodities. Silver, copper, salt, corn, tobacco, knives and sundry other things have been tried as denominators of value. The North American Indians used beads of shell (wampum) as money, and in some of the colonies it is said that the white men gave wampum the status of money. But, by-and-large, gold has won most of the blue ribbons as a monetary unit, with silver outdistanced in second place.

#### Money in the Flesh

Gold is three things in one. It is a commodity; it is a measure of value for all other commodities; it is a medium for the storing of value in itself.

Let us enlarge the picture. If I have gold in my purse, I have there a share of all the things in the world that can be purchased. Gold, we may say, is money in the flesh. This is so because it is universally acceptableeverybody wants it, all governments (and peoples) want it whether they be Republics, Monarchies or Dictatorships. And if I should have my govenment's promise to pay in gold I should have the next best thing to gold-my government's solemn pledge to give me a fixed quantity of gold of a specified purity for each dollar that I possessed and to give it to me on my demand. But if I have United States paper money (legal tender) in my purse today I have nothing but an IOU. It is an IOU to pay me in the same kind of paper money or in silver at a price arbitrarily determined by the Government.

Under the Gold Reserve Act of 1934 the citizens of this Land of Liberty are prohibited from holding gold or gold coins. If we mine, smelt and refine gold we must sell it forthwith to our government at \$35.00 per ounce (paper dollars). Of course, the gold might have brought more in a free market, but we are not allowed to obtain more than our government's ceiling-floor price even though it should cost us 40 or 50 dollars per ounce to produce and refine it.

#### You Can't Eat Paper Either

It is true, as economists of the Keynesian School are fond of saying, you can't eat gold! The courteous retort is—who said you could? The fact remains that the gold a man had (when he had it) would buy anything he wanted to eat anywhere in the civilized or uncivilized world—unless he was marooned on a desert island. In that instance, no doubt, paper money would be superior to gold—in starting a fire.

Let us remember this. The hoard of some 23 billions of dollars of gold buried at Fort Knox and elsewhere is practically dead gold as far as it concerns the American people. We surrendered title to it in 1933 and 1934 and it now belongs to Caesar. It might just as well stay buried until we insist that our Congress repeal the laws which forged our own shackles, until we force Caesar to make it available to us in exchange for paper money when we wish it.

Our money managers in Washington, the Treasury and the Federal Reserve, are shadow-boxing with that gold. They may and do sell it to Central Banks of foreign countries and they may and do sell it at \$35.00

per ounce to industrial users, thus in effect subsidizing these users at the expense of our gold miners. But they cannot lawfully sell it to ordinary American citizens. Also, since they are not required by law to redeem our currency in gold, they are under very slight restraint from creating money or issuing Government bonds which in the blood stream of the Federal Reserve System breed money.

#### Like a Toothless Dog

No doubt, those who favor the present practice of money-management-by-ear will assert that we are in a sense on a gold standard. They will acknowledge that the Government possesses a vast stock of gold but will point out that this gold is represented by Gold Certificates (warehouse receipts) held by the Federal Reserve Banks. This is true, and these Gold Certificates constitute part of the basic reserve in our banking system. However, the gold itself is by law unavailable for the redemption of paper dollars and hence has lost its

Standard in this or any other country is not a guarantee of fiscal, economic or social sanity, it is an illusion to believe that sanity can be restored without the resumption of such a Gold Standard. Redeemable money (goldbased convertible) is honest money, for gold money is gold, and gold serves to discipline politicians and bureaucrats in economy. The world supply of this precious metal is limited and its production stable. In contrast, the raw materials from which paper money is made are available in almost infinite quantities. Nevertheless our wise men of Washington are doing their best to consume the paper supply via the printing press. Al Smith once called our post-1933 paper money, "baloney dollars." Today's dollar won't even buy much baloney.

Year after year the prices of things we buy go up and up and up. This is not the fault of the things but of the over-supply of money issued or caused to be issued by our Spendthrift Government, the biggest business concern in the world. This is inflation in



Just like copper wire-gold is a commodity

classic power as commodity-money. The Federal Reserve Banks may expand their liabilities (notes and deposits) to a potential amount four times this basic reserve, and the commercial banks have a further enormous expansion power. Total money (currency and deposits) of all the banks in the United States has increased from about \$60 billion in 1940 to more than \$180 billion at the present time. This increase can go very much further under the existing laws. No wonder the American dollar is worth today only 50 cents compared with the 1939 dollar. Yes indeed, we have a gold standard-a hybrid monstrosity about as effective as a Watch Dog with his teeth drawn.

#### Prices Go Up and Up

Thus, unredeemable money is a cinch for the Government and a fraud for the people. While it goes without saying that a return to a true Gold

earnest. We should have this fact very clearly in mind. The inflation which we are talking about is a phenomenon of the money supply—or rather its over-supply. It is produced and stimulated by the extravagance of government and the folly and greed of government and by nothing else. Inevitably it brings about an uncontrollable rise in prices and wages, which, unless the inflation is cured at its source, leads on to economic and social ruin.

#### **Controls Beget Controls**

An increase in the output of goods will not cure inflation. It may lower the price of those particular goods in over-production but it merely serves to warp the economy. It may even cause a major business depression, but it cannot eliminate the disease in our fiscal body which cries for more oxygen. Government cannot control inflation for the simple reason that one



The gold miner must exchange scarce gold for plentiful paper inoney and then can't buy the gold back

set of controls for prices, wages, production, etc. begets another set of controls, ad infinitum, until we wake up to the fact that we have a totalitarian and a corrupt government. At that point our money will lose all meaning. It will buy what the tyrants say it will buy—no more, no less.

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This money disease, this inflation, will certainly continue and eat us all up like a hungry wild animal unless the process of printing fiat-money is checked by lining our currency brakes with fine gold. When and if our dollar represents the value of a fixed quantity of fine gold, interchangeable therewith, governments cannot twist it from its economic moorings with

impunity. It becomes an honest dollar again.

#### **Gold and Peace**

The official price for pure gold today is and has been since 1934—\$35 per ounce (480 grains), or expressed the other way around, \$1.00 is equal to 1/35th of an ounce (13.714 grains) of gold. If the United States wisely decides to return to a gold standard and to cause its monetary unit to be redeemable in gold, it must set a price for gold which will be related to the value of the yellow metal and which can be readily maintained. The value of gold in the free markets of the

world appears to be higher than \$35.00 per ounce. That is to say its purchasing power has increased since 1934. Our best minds will have to be recruited to solve this vital problem of gold's proper redemption price in the light of its international value. Above all it must be realistic.

A Gold Standard for this country should have top priority among domestic considerations and it should inevitably mean an international standard if it is to last. For about one hundred years after the Napoleonic Wars, Great Britain maintained a highly successful gold standard, and for years prior to World War I, an international gold standard market functioned satisfactorily among such important countries as England, United States, France, Germany, Austria, Holland, Switzerland, the Scandinavian countries and Japan. Now it is our turn for leadership, and our solemn responsibility, to anchor our money to gold. No peace among the peoples of the world is likely to endure for long without the binding element which gold can provide as a standard of exchange and value.

That is what is meant by a Gold Standard in the American tradition—a monetary system where the dollar in terms of which prices are expressed consists of the value of a fixed quantity of gold in a reasonably free international market, a dollar interchangeable with gold.

When all is said and done, it is your money that is involved and your gold, too—before you kissed it good-bye.

#### Roof Bolting at U. S. And Lark Mines

(Continued from page 35)

that during the test period experimental locations were scattered. Where equipment was in place and ready for use the actual number of bolts installed was as high as seventeen per man-shift. It is obvious that the number of holes drilled and the bolts installed depends upon the drilling conditions and the skill of the miner. At both U. S. and Lark Sections, setups are now such as to greatly increase the number of bolts installed per manshift. The average area of roof supported per bolt is 10.5 sq ft with 3.3 ft between bolts.

#### **Bolting Costs Less**

Complete costs on all roof bolting operations were recorded. Cost per bolt complete averages \$1.67 and the labor of installation \$2.79, giving a total cost of \$4.46. Over-all cost comparison of bolting with timbering is incomplete.

At intersections where timbering is

required the average cost per square foot for timber is 50 cents as compared with 42 cents per sq ft for bolting. The indicated saving is 16 percent. The reduction in maintenance cost is substantial.

#### **Experience Summarized**

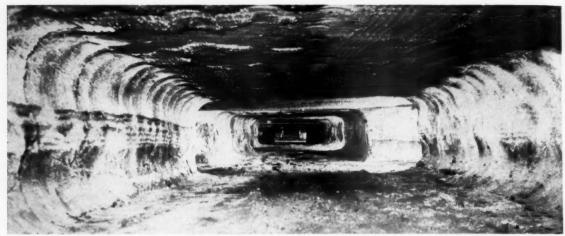
Final results of many of the experiments can not yet be determined. Experiments have shown where roof bolting is effective. Under such conditions roof bolting will be continued. Experiments have also shown where roof bolting has been ineffective. In some such conditions roof bolting will be abandoned. In others, tests will be continued.

The results of roof bolting at the U. S. and Lark Mine can be summarized as follows:

- Bolting is effective where anchorage can be obtained in a stratum that has not flexed to any extent.
- (2) Placing of bolts before collaring of openings has reduced overbreak and timber requirements.

- (3) Fire hazards have been decreased.
- (4) Roof bolts are successful in heavy ground in conjunction with timber.
- (5) Maintenance costs are lower.
- (6) The practice has not been effective in the stopes tested, but experiments will be continued in other stoping areas.

LISTEN! READ!
LOOK! TALK!
ARGUE! THINK!
THEN



The 16-ft entry allows more maneuvering space

EARLY in 1950 the Christopher Coal Co. decided that mining conditions in the Brock Mine at Pursglove, W. Va., were such that continuous mining would more than likely prove successful. Roof conditions were known to be excellent over large developed areas, seam height was uniform, and bottom conditions good. Therefore, in April 1951 a Jeffrey 76-B Colmol was installed and put to work.

The Sewickley Seam at Brock is about 72 in. thick, overlain by a dense hard lenticular shale. The true bottom is known locally as the "sheepskin a hard lenticular band underlain by several inches of coal and a fairly hard fireclay. The bottom six in. of the seam is high in ash and it is the practice at Brock to mine only the top 66 in. of coal.

Roof over the major portion of the developed areas is very good but in several localities a sandstone intrudes between the coal and the normal shale roof. Here the roof conditions are very poor. Conventional timbering has proven inadequate in these areas and the only successful mining has been accomplished through the use of roof bolts. In areas of good top no support is needed.

#### **Previous Production High**

Conventional off-track mining crews using crawler mounted loaders, shortwall cutting machines and shuttle cars were producing an average of 460 tpd, with 13 men. Face production of more than 35 tons per manshift was needed to justify the expense of installing a continuous mining machine. It was felt that if continuous mining equipment were to be successful anywhere, it should prove so at Brock under the excellent conditions known to exist there. The 76-B Colmol was chosen for the experiment.

The machine is 26 ft long, 8 ft 21/2

# Operating Experience With the Jeffrey Colmol

Output Averaged 72 Tons per Manshift Over 70 Shifts but Even Better Results are Expected in the Future

By F. R. ZACHAR

General Superintendent Christopher Coal Co.

in. wide across the heads, and has a tramming height of 47 in. This unit is designed to mine 9 ft 6 in. wide and to select a mining height of from 56½ in. to 72 in. The machine is rigid, in that the head or boom does not swing. All mining on turns must be done by repositioning the whole machine. Total weight of the machine is 35 tons and it is supported on two crawlers 12 in. wide with a bearing length, on the bottom, of 9 ft 9½ in.

All functions of the machine are performed hydraulically through pumps driven by three, 70 hp, 250-v motors. Two motors drive the pumps which furnish oil to the digging head motors and the third motor drives pumps which furnish oil to the other elements of the machine. Maximum pressure necessary to drive the dig-

ging arms is around 1800 psi when bits are in good conditions and the machine is advancing its full width at the rate of 18 ipm (in. per min).

When advancing at 18 ipm the machine pulls about 550 amps. Two 500 MCM power cables and one 250 MCM safety ground-cable supply power. Experiments with smaller cables have proven unsatisfactory and the heavier cable is now standard.

#### **Drive Wide Places**

Prior to the installation of the Colmol is was planned to use the machine to drive entries and crosscuts only 9 ft 6 in. wide, the maximum mining width of the machine. It was intended to keep the machine continually driving ahead, thus the 9 ft 6 in. width. However, after mining the first 40 ft it became evident that



Mining conditions at Brock Mine are excellent over wide areas

this width was not sufficient. First the confined space was unsafe for the operator if roof should begin to fall or if a cable should blow when a shuttle car was under the boom; and second, because timbering in these narrow places must necesarily be on angle roof jacks set into the ribs to permit passage of the shuttle cars or to back the Colmol out of a place. Therefore the original plan was abandoned and working places were driven 16 ft wide. This width is mined in two lifts, 9 ft 6 in. and 6 ft 6 in.

Original plans would have made it necessary to drive all breakthroughs on 45° angles, but with the 16-ft widths the operators were surprisingly quick to develop techniques permitting 90° breakthroughs.

#### **Development Cycle**

The entry development plan adopted after one week operation is still in effect. As shown in Figure 1, an advancing cycle is considered begun when the headings are mined to the extent shown outlined in heavy black. The first place mined on the new cycle is No. 5 heading. This heading is driven in successive 9 ft 6 in. and 6 ft 6 in. lifts until the face is 100 ft ahead of the open crosscut center line. The Colmol then moves out of No. 5 and drives No. 4 and No. 3 in the same way and for the same distance. No. 2 heading is widened out as shown, at the point where the next cross-cut comes through and then advanced to the 100-ft point as in the case of Nos. 3, 4 and 5. After finishing the required advance in No. 2 the machine is backed out and drives the cross-cut through into No. 1, which is then advanced 70 ft to put it 100 ft ahead of the new cross-cut. After No. 1 is driven, the machine backs out and makes a right turn through the newly driven cross-cut and trams to No. 2 where it starts the cross-cut to be driven to No. 5. When this cross-cut

has holed into No. 5 the advance cycle is repeated.

This system has several distinct advantages. First, the mining unit is kept advancing a maximum of the operating time. Second, as the power source is on No. 2 heading, this sys-

tem eliminates the wrapping of cables around any block as would occur if the cross-cut were driven through from No. 1 to No. 5. Third, by having all straight places 30 ft past the cross-cut center line at the start of an advance cycle, two buggy roads can always be maintained as the loading unit is entirely in the clear. The fourth but not the least advantage is the fact that only one turn is made with the rigid and non-flexible machine. It is to simplify this turn that No. 2 heading is driven as shown. This heading is widened out on both sides at the point where the cross-cut is to come through so that when the machine pulls back from No. 2 face and turns toward No. 1 the extra width on the No. 3 side provides the room for the lengthy machine. By using this system, "ball field" intersections have been eliminated.

The "tipple" or loading point is advanced every 210 ft to insure relatively short buggy hauls. The loaded track is kept laid up with 60-lb rail on wood ties. Since six in. of bottom coal is left it is necessary to dig up this coal and to place the ties on the "sheepskin." While extra labor is

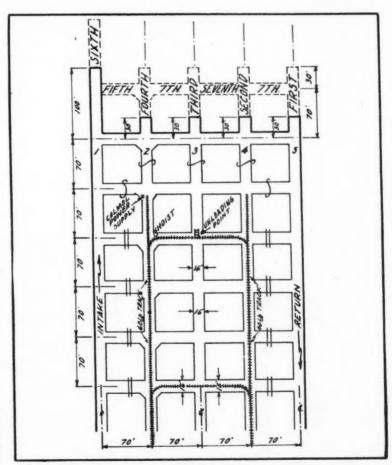


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necessary to take up coal, the resulting trench keeps the track in line.

#### **Need Auxiliary Loader**

In the first operating shift it was evident that loading from the Colmol directly into shuttle cars would not be successful. It was not possible to load shuttle cars to capacity with the rigid boom and every time a loaded shuttle car pulled away, mining stopped. A third, and very important reason is that when mining the open end or 6 ft 6 in, lift, considerable coal is thrown toward the center of the entry by the outside top digging arm. This spillage amounts to about two tons per 25-ft advance and to clean up loose coal with the unit, cut down on valuable face advancing time. For these reasons a crawler type loading machine is used to pick up coal discharged on the bottom and to load it into shuttle cars. The Colmol helper became the operator of this machine. The use of the loading machine not only solved the three problems mentioned above, but also provided a means of handling the heavy and bulky cables when the Colmol was backing up; kept the entire section cleaned, and provided a source of power for a hand held drill used to drill rib holes for cable hangers.

The standard Colmol crew consists of:

- 1 Colmol Operator
- 1 Joy Operator
- 3 Shuttle Car Operators
- 2 Timbermen

7 Men

Buggy runners and timbermen are qualified to interchange jobs and there are two qualified Colmol operators on the crew in addition to the regular operators. No tipple man is used as remote hoist control buttons are provided. A section foreman and a part-time mechanic complete the crew.

#### **Timbering Simple**

Cross timbers or roof bolts have not been needed in the good roof areas mined to date. No bad roof conditions have been encountered in driving over 40,000 lineal ft of entry. There can be little doubt that absence of blasting shocks has contributed to this success. Two timbermen can move safety jacks as necessary and shovel loose coal to the pick-up machine.

#### **Expect Improved Production**

As of March 31, 1952, the Colmol had produced 147,453 tons in 326 working shifts for an average of 452 tons per shift. A seven-man crew was utilized at all times and the average of 64.7 tons per man shift for the 10-month period was achieved.

During December 1951 and January 1952 the unit was taken out of service to make certain mechanical electrical and hydraulic equipment changes which were thought necessary. This was not a rebuild as generally considered, but rather the carrying out of certain basic changes in the design of the machine based on the experience of over eight months. Evidently this work was successful as performance improved during February and March 1952. In 70 shifts during these two months the machine produced 35,274 tons for an average of about 504 tons per shift and 72.0 tons per man shift.

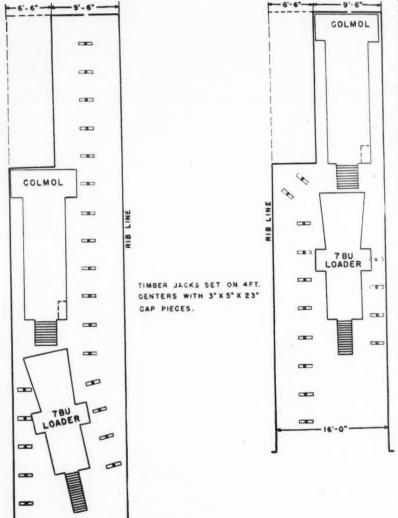
Management fully expects to produce at least 600 tons per shift and to realize 85 tons per man shift in pillar mining after entries are driven to the back of the property. This estimate is based on time study data and on the fact that peak tonnages of over 700 tons per shift have been produced.

To date the size consist of the loaded product of the Colmol has not been satisfactory. Recent tests indicate the following comparison of the Colmol coal with that produced by conventional, off-track equipment:

4 x 2 in.	Colmol 8.5%	Conven- tional 17.9%
2 x 1 1/4 in.	7.1%	10.0%
1 1/4 x 1/2 in.	20.2%	23.2%
½ in. x 0	64.2%	48.9%
	100.0%	100.0%

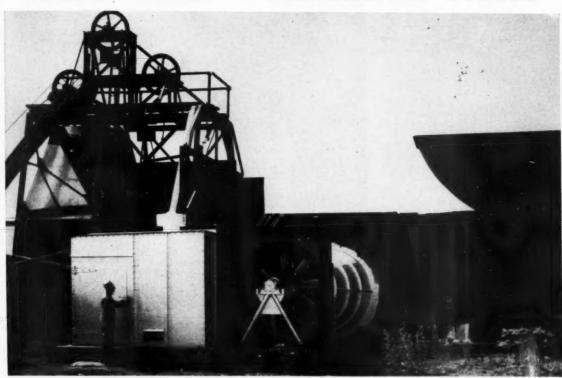
However, experiments with certain changes on the standard digging arms and with arms of different design are being conducted. It is believed that eventually an arm design will be developed that will give both

(Continued on page 66)



Timbering is done in accordance with these standards and offers no problems

### Metal Mine Ventilation Notes



Huge fans are required to pass the enormous quantities of air needed to ventilate deep mines

#### Long Experience Proves Ventilation is More Than Just Blowing Air into a Mine

lized after close technical analysis of all the factors involved.

WHILE metal mine ventilation practices naturally vary with differences in mining methods at different mines, the fundamental mechanics of air flow, or heat transfer, affecting ventilation problems do not change. In the interest of economy they are worthy of more consideration than is often given them in planning mine ventilation work. In early operations carried on with hand steel, where a sufficient reward for the work done was often carried in ore that might be removed from the mines in a candle box, the ventilation problem was usually not important. It certainly did not call for any specialized technical treatment. Now, some operations are carried on at mining depths of 10,000 ft with natural rock temperatures ranging up to 150° F, or higher, and block caving operations call for the breaking and transportation of larger tonnages of ore than were ever dreamed of in earlier underground operations. Ventilation problems are correspondingly more complex, and economic solutions may only be rea-

#### **Air Requirements Great**

In the case of deep mines having high rock temperatures, more than 15 tons of air may be required for the ventilation system for each ton of ore mined. In the case of block caving operations in relatively cool ground, the ratio may be only as low as 1.5 tons of air per ton of ore. In either case, the expense of circulating such quantities of air through the mine will be considerable.

To provide economically for the flow of these quantities of air it is necessary to take into consideration both the size of the air course and the character of its surface. Since the factors of frictional resistance to air flow, offered by different types of air course surfaces, may vary by as much as 1 to 8, it follows that power consumption for constant air velocity will vary in the same proportion. As a rough guess, the total charge for

By A. S. RICHARDSON

Formerly Ventilation Engineer Anaconda Copper Mining Co.

power for moving air at a velocity of 3000 fpm through a rock cross-cut in blocky ground will exceed the cost of excavation in less than three years. For greater service life, better designs should take into consideration both power consumption and probable repair costs.

Earlier records of practice in some European coal mines record that in days of more plentiful manpower it was not uncommon to employ men to remove irregularities from the rock surfaces of main air courses with hand moils. Such close control is hardly possible today, but is in marked contrast to conditions that are not unusual in many present-day mines in this country.

#### Difficult Problems at Depth

With continued increase in depth of any mining operation, the cost of maintaining the ventilation system will also increase—usually in a disproportionally greater ratio. Where the natural temperature of the rock

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increases rapidly in depth, it may become impracticable to maintain a satisfactory standard of temperature and humidity conditions by ordinary ventilation methods. The use of artificial air-cooling then comes into consideration and a number of plants have already been installed for this purpose.

The particular air-cooling method most advantageous for any mine will depend, to a large extent, upon local climatic conditions. At one mine, cold air was used during winter months to form ice in old workings near the surface, and then in summer warm air entering the mine was passed over the ice to improve its cooling capacity. In South Africa, plants have been built to cool air for mine ventilation by artificial refrigeration both at the surface and underground. In the United States, the methods used to cool mine air include underground plants with artificial refrigeration equipment or water circulated in closed pipe circuits from surface cooling towers to underground air cooling plants. The latter method had its inception in the Butte District.

#### Recirculation Reduces Cost

Because of the temperature changes occurring in any flow of air passing from the surface to workings on the lower levels of a deep mine, it is hardly practicable to maintain as low temperatures by ordinary ventilation methods as are possible with air cool-



Auxiliary blowers are used to force fresh air into individual working places

ing plants located close to the active workings. With rock temperatures above 120° F some experience indicates that the air cooling plant should be not more than 1000 ft from the area to be cooled. However, recirculating a large part of the air passing from the cooling plant to the working places greatly reduces the total requirements for air to be circulated through the mine.

Although qualitative results obtained by ordinary ventilation and by air cooling plant method are, for the mine conditions under consideration, not strictly comparable, it is possible

to make some economic comparisons on the basis of heat units removed from the mine. The major item of cost for any underground air cooling system will, of course, be the mechanical equipment. No general statement can be made that will be applicable to all methods used. In one case, the cost of equipment per unit of cooling effect, on the basis of a ten year service life, equals approximately two-thirds of the total capital and operating expense. Further increase in service life decreases the proportional cost of equipment, and for a recent ten year period, the cost per unit of cooling



It is easier to prevent dust from becoming airborne with a water spray at the face than to filter it out later



Air passed through a spray chamber is cleaned and loses much of its heat

effect by underground cooling plants, approximates one-half the cost by ordinary ventilation methods.

However, since it would be impossible to eliminate entirely all flow of fresh air through the mine by the use of underground air-cooling plants, it can only be considered that these plants are an economical supplement to ordinary mine ventilation methods, where necessary to combat exceptionally high rock temperatures.

#### **Fire Control**

Among other problems, where ventilation engineering practices has more recently come into use, is the fighting of metal mine fires. A common early day fire-fighting practice was to flood the mine with water. However, the results were drastic, and since such fires are often caused by spontaneous combustions due to ground pressure, accompanied by oxidation of ore and lumber, a recurrence of the fire was probable as soon as the water was pumped out. During later years, these fires have been extinguished, or controlled with relative ease, by enclosing the fire area with air-tight stoppings and allowing the fire to smother in the products of combustion.

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In carrying out such a program of fire control, it is usually necessary to make some adjustments to the ventilation system so as to regulate the air pressures affecting the fire area. Air presures on all important stoppings are taken periodically and recorded. Samples of air and gas are also taken periodically for chemical analysis to

show progress in the change of atmospheric conditions in the fire area. By these methods the disastrous consequences of early day fires have been largely eliminated. Where valuable ore remains in the fire area it may be recovered by the well known method of slime filling.

While relatively few metal mines are vitally affected by extremely high temperatures and humidity conditions, nearly all mines have some dust problems. So much publicity has been given during recent years to silicosis and to methods of dust prevention that it is hardly possible to add much more.

#### **Dust Abatement Important**

Present-day assumption is that, in metal mines, only dust carrying free-silica is hazardous, and maximum allowable concentrations are based on the percentages of free silica present as well as the numerical dust count. However, some of the most competent authorities believe that high concentrations of any kind of dust are hazardous.

The methods of measuring the concentrations of dust present in mine air that are prescribed by the authorities in this country are not the same as those used in other countries. Absolute accuracy of measurement seems to be impossible and the counts obtained by different methods vary widely

In some mining operations it is practically impossible to prevent the circulation of air from one working place through another so that high

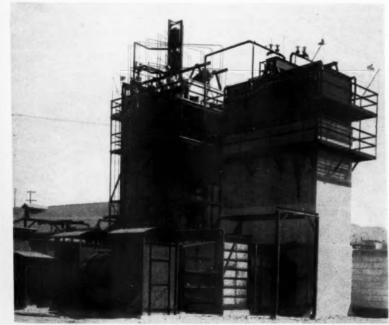


Air cooling plants close to working places are a practical means of keeping temperatures down

concentrations of dust, generated in one place, may have extensive effects elsewhere. Often high dust concentrations are of only momentary duration, but there are many cases where the continuous removal of dust from mine air is a problem of grave importance.

From an engineering viewpoint, the dispersion of dust into air is, to a large extent, preventable by the use of water or wetting agents. It is much more difficult to remove it from the air by filtration; particularly the very fine particles that are of hygienic importance.

The requirements for reducing high dust concentrations to a count within maximum allowable limits, impose the need for very high operating efficiency on mine air filters, particularly in respect to the finest sizes. Mine air filters must also be ruggedly designed ior transportation underground and to withstand rough mine usage. Tests of a number of mechanical filters indicate that they are not well adapted to removal of the finest particles of dust. Some of the best results so far were obtained with an electrical filter that was maintained in experimental use underground for over a year and discharged air that was visually clear of dust and smoke during the regular blasting period.



Water from surface cooling towers moves in closed pipe circuits to underground air cooling plants



is not a sentiment - it is an economic necessity. ---- crarks summer

OURNAL

## Operators Corner

## Bodily Care Applied to Lead Storage Batteries

By S. K. LESSEY

Manager, Service Division
The Electric Storage Battery Co.

WHETHER the lead batteries used in mine work furnish operating power for locomotives and other mobile equipment, or provide starting power for diesel operated machines and vehicles, the fundamentals of their care are the same. These fundamentals, generally speaking, are:

- (1) Proper installation
- (2) Adequate charging
- (3) Sufficient cleaning
- (4) Periodic addition of water

In the care of the human body there are good parallels to these four basic maintenance rules which not only illustrate their worth, but make them easier to remember and apply.

#### Proper Installation

If the marching feet of an army break down, the army breaks down. The army experts know that feet must not be cramped, yet must not be loose in their shoes. Soldiers' feet, therefore, are carefully measured and fitted with sturdy boots, neither too tight nor too loose, which support and protect them from chafing and harm. Compartments for power batteries,

or for diesel starting batteries cannot be individually fitted, like shoes, but blocking can, and should always be used to prevent excessive movement or shifting. About 1/8 in. should be allowed between the battery and the blocking all around.

Holddowns, which might be termed compartment "shoe laces", are required for the smaller types of batteries used for engine starting. They should be tight but not excessively so.

The careful design and planning of the battery manufacturers to insure a snug, wear-proof fit of battery elements in their containers can be rendered useless by poor fitting or fastening of batteries in the equipment compartments.

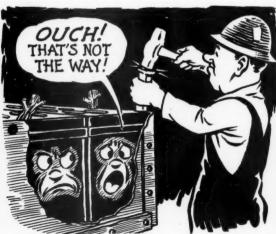
#### **Adequate Charging**

Any man can work for short periods on "short rations." Over the

long pull, however, he needs to be well fed every day. Conversely no man can work well if he is gorged with food and he may in fact shorten his life by over-eating.

Working batteries, such as locomotives and similar power types, should be charged at rates recommended by the manufacturer long enough to provide five to 15 percent additional charge in ampere hours over and above each discharge. At the start of a charge a battery may be charged at any rate in amperes that will not produce gassing or bubbling of the electrolyte, or raise the cell temperature beyond 110° F. The best method of charging will depend on the number of cells in the battery, the time available for charging and the voltage and capacity of the charging equipment. Wherever possible the equipment should be arranged so that the









rate of charge will be automatically reduced to the published charging or finishing rate of the battery by the time the charge is nearly complete.

Automatic charging equipment is recommended because it prevents waste of charging current and excessive charge into the battery while assuring that each charge is adequate.

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Once a week batteries should be given the tonic benefits of an equalizing charge to insure that all cells are "evened up" in their state of charge, or health. The equalizing charge is given at the published charging rate of the battery for three or four hours after the regular charge has been completed. If a battery is idle for any length of time it should be charged at least once a month and every charge made an equalizing charge. Manufacturers of automatic charging equipment usually provide easy means of giving equalizing charges, as by resetting timers or turning back ampere hour meters.

Charging generators for diesel and other starting batteries are usually controlled by regulators designed to insure that the batteries are maintained in a satisfactory state of charge. The regulator adjustments which control the amount of charge, should normally keep the specific gravity of the electrolyte above 1.225 without the battery requiring unusually frequent additions of water. Water requirements under various operating conditions, as in winter and summer, are published in the battery manufacturer's instructions, and provide the most reliable guides for regulator settings.

#### Sufficient Cleaning Needed

Men work better in clean surroundings and in clean clothes. They are then less apt to develop skin or other infections, or to contract industrial diseases. Batteries are no exception.

Power batteries should normally be cleaned by blowing off accumulated dust with compressed air. Regular washings with water are also recommended. If water is scarce or not available, the batteries may be given "dry shampoos" with hydrated (airslaked) lime. The lime should be brushed on and then blown off with compressed air after use.

Two or three times a year the battery should be given a thorough bath using a soda solution (one pound of bicarbonate of soda to one gallon of water). Some operators use a "venturi" tube type of spray gun to apply the soda solution and have found it very effective. The availability of compressed air at most locations makes the method an easy and rapid one since the pressure application of the soda solution can be combined with the drying off, which prevents the accumulation of dampness and corrosion. A quart of soda solution will clean a large locomotive battery and the residue of soda left on the battery will not be harmful to opera-

During all cleanings the vent plugs must be in place and tightly closed.

This "bath" routine applies to starting batteries as well, and if followed should keep all of them free from grounds and corrosion of parts. If any corrosion of terminals or connections should develop, the affected surface should be scrubbed clean, using a stiff brush and soda solution, then rinsed with clear water, dried and coated with No-Ox-Id grease, or vaseline.

#### **They Need Water**

Any man gets thirsty, and the harder he works the more water he will need, and drink. The same is true of any battery, though a battery does not require water as frequently as a human being.

Power batteries will need additions of water more often than starting batteries. Their electrolyte levels should be checked weekly; those of the starting batteries monthly. Sufficient wa-

ter should be added regularly to keep the level above splash covers or separator tops.

Water should not be added higher than recommended in the manufacturer's instructions. When the level is too high electrolyte may be lost from the cells and cause several kinds of trouble. Electrolyte lost from a cell reduces its capacity and its ability to perform. Spilled electrolyte on cell covers collects dirt and causes electrical grounds and leakage.

Experience has shown that water from most local sources of supply is suitable for addition to all types of lead batteries. Only approved water should be used for this purpose, however, and local water should be analyzed and approved by the battery manufacturer before use.

It may rightly be said, therefore, that the proper care of the human body is akin to the proper care of a storage battery and that, in general, what is good for one is good for the other. Remembering these similarities when carrying out the four simple rules of maintenance just outlined, will insure long and satisfactory service from the lead storage batteries in mine service regardless of the type of work they are called upon to do.





## Wheels of GOVERNMENT



#### As Viewed by A. W. DICKINSON of the American Mining Congress

DEPARTMENTAL appropriation bills and other "last minute" legislative measures are streaming up Pennsylvania Avenue from the Capitol to the White House, as the windup of the 82nd Congress nears. The members are all set to take off to the National Conventions in Chicago and to their home States and Districts for the summer campaigns. A few will depart for observation tours in foreign lands, as well as in our own western States, Alaska and the Insular Possessions.

As the situation now appears, there will be a minimum of activity in Washington through the summer and probably until the new 83rd Congress convenes in January of next year.

#### **Defense Production Act**

Hard working Senate-House conferees reached agreement on the Defense Production Act extension bill at 2:00 a. m., June 28, and on June 30 the President's signature completed enactment of the legislation. The new Act extends wage and price controls to April 30 of next year and priority powers and authority for defense production loans for two months longer to June 30. An outstanding feature is the request that the President use the Taft-Hartley Act to stop the steel strike.

Nationwide criticism of the methods pursued by the Wage Stabilization Board resulted in its replacement by a new tripartite Board, all members of which must be confirmed by the Senate. This Board is to have no power in settling labor disputes and is authorized (1) to formulate and recommend to the Economic Stabilization Administrator for promulgation "general policies and general regulations relating to the stabilization of wages, salaries and other compensation," and (2) upon the request of any person substantially affected by a regulation, or of any affected Federal agency, to "advise as to the interpretation, or application to any particular circumstances, of policies and regulations promulgated by such Administrator which relate to wages, salaries and other compensation."

On the International Materials Conference issue, the Act contains a compromise provision under which, when a country participating in the IMC finds that it will not use all the material allocated to it, United States users of the material will have an opportunity to buy the unused supply. This provision was intended by the conferees to meet in part the objection to United States participation in IMC.

The Talle (Rep., Iowa) amendment in the House bill was dropped in the conference. It would have terminated price controls on all items not subject to allocation or rationing.

#### **Utah Wage Case**

The current strike situation at a number of Utah lead-zinc mining properties emphasizes the importance of the work done by industry members of the Wage Stabilization Board Panel, and by those who appeared in opposition to the CIO United Steelworkers before the Panel and later before the full Board. The decision issued by the Board on June 20 cut down, in part at least, the previous Panel recommendations which had been dominated by public and labor members.

In the U. S. Smelting Refining and Mining Co. case the Panel had recommended a \$14.55 rate for miners, with an increment between job classes of 3¼ cents per hour; the over-all cost not to exceed 20.13 cents per hour. For Combined Metals and New Park Mining Co. the recommended rate was \$14.16 for miners and an increment of 2¼ cents per hour between job classes.

The June 20 Board decision in the U. S. Smelting case reduced the Panel's recommended rate of \$14.55 to a rate of \$14.36. The Board further ruled that remaining jobs should be classified so that the increase per

#### Washington Highlights

CONGRESS: Adjourns sine die.
UTAH WAGE CASE: WSB decision.
DEFENSE ACT: Extended.

MINING LAW: House approves Regan bill.

ST. LAWRENCE: Senate shelves bill.
COAL MINE SAFETY: McConnell
bill in White House.

PALEY REPORT: Now available.

\* \* \* \* \* \* \*

weighted average straight-time hour, including the 8-cent general increase, will not exceed 18 cents per hour—this in contrast to the Panel recommendation of 20.13 cents. The Board set the Combined Metals and New Park base rate at \$11.30 per 8-hour shift, and the miner rate at \$14.16.

High production costs and lower metal prices are intensifying a difficult situation, with many of the current contracts expired as of July 1.

#### **Mining Law Revision**

The House has passed the Regan (Dem., Tex.) bill which takes sand, stone, gravel, pumice, pumicite, and cinders out from under the mining laws and permits their disposal, when situated in National Forests, by the Secretary of Agriculture. On a recent trip to California, Representative Clair Engle conferred with representatives of natural resource industries affected by the bill and drafted an amendment under which lands containing the minerals named in the bill would continue to be subject to location and patenting under the U.S. mining laws, where such locations are based upon the discovery of metalliferous ores or other minerals, specifically named in the location notice, and which are subject to location and patenting under the mining laws.

Members of the House Interior and

Insular Affairs Committee, as well as representatives of the Bureau of Land Management, were agreeable to the Engle amendment and the bill was reported to the House June 25 and passed on July 2.

#### St. Lawrence Project

The St. Lawrence Seaway and power project was shelved by the 82nd Congress on June 18, when the Senate by a vote of 43 to 40 sent the Green (Dem., R. I.) bill back to its Foreign Relations Committee for further study.

On July 2 the White House again urged Congress to approve U. S. participation in the Project before adjourning. The President said that failure to approve the "self-liquidating investment" would be the most "glaring example of shortsightedness in the history of our Nation's development of natural resources." In the final pre-adjournment legislative logjam it was considered very doubtful that the President's appeal would bring about any further action.

Meanwhile our State Department has acted with the Dominion of Canada in requesting an International Joint Commission to approve the initial power project. Under this line of procedure the State of New York may join with the Canadian Government in financing the power project.

#### **Coal Mine Inspection**

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White House approval is momentarily expected of the McConnell (Rep., Pa.) Federal Coal Mine Inspection bill, discussed in the June issue, which passed the House and was sent to the President by the Senate on July 2.

Under the provisions of the bill a Federal inspector may order men withdrawn from a mine when, under the minimum safety requirements forth in the bill, he finds danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident may occur. Appeals from Federal inspectors' rulings may be taken to the Director of the U.S. Bureau of Mines, to a Federal Mine Safety Board of Review composed of three members appointed by the President (with advice and consent of Senate), and thereafter to U.S. Circuit Courts of Appeals.

Before reporting the McConnell bill to the House, the Education and Labor Committee added Chairman Graham Barden's (Dem., N. C.) amendment intended to hold the powers granted to Federal coal mine inspectors to a minimum degree of infringement on State law and State responsibility, and to provide for coordination of Federal and State activities in coal-mine safety. Any State desiring to cooperate under the bill may submit a State plan to carry out such

purposes. Such a plan shall: (a) designate the responsible State agency; (b) give assurance that it has or will employ an adequate and competent staff of inspectors to make mine inspections within the State; (c) give assurances that when called upon it will assign inspectors to participate in the inspections; and (d) provide that it will make reports in order to furnish information to the Director of the U. S. Bureau of Mines. The Director shall approve any State plan which complies with the above requirements and may not disapprove any such plan without affording notice and opportunity for hearing. The Director, after notice and hearing, upon finding that there is (a) a failure to comply substantially with a State plan or, (b) a failure to reasonably cooperate in administering the provisions of the bill, may withdraw his approval of such plan, and upon receipt of notice of such action the plan shall cease to be in effect.

In any State in which a State plan is in effect, it is contemplated that the Federal inspector and the State inspector shall inspect a mine together, as the bill requires in such a State that no inspection shall be made by a representative of the Bureau of Mines unless a State inspector participates therein. However, if, in the Director's judgment, an inspection is urgently needed to determine if danger of a disaster exists in a mine, and participation by a State inspector would unreasonably delay the inspection, the Federal inspector may inspect the mine without the State inspector. The fact that a State inspector participates in the inspections in a State where a cooperation plan is in effect, in no way interferes with the closing of the mine by Federal inspector upon finding of immediate danger of a disaster. The mine is closed by the Federal inspector, whether the State inspector concurs

#### Paley Report—Minerals Policies

The President's Materials Policy Commission (Paley Commission) has labored long and brought forth a one-million word, 5-volume report outlining policies with a view to assuring adequate mineral raw materials for our country's economy. The report treats of metals, minerals and other raw materials throughout the world, assessing our needs over the next 25 years, and predicts that the need for industrial raw materials will increase up to 60 percent by 1975.

In a recommendation which will meet with strong opposition, a high protective tariff for America iudustry is declared to be obsolete and the "Buy American" Act is dubbed a "relic of depression psychology." The

whole theory of economic self-sufficiency is declared to be defeatist and protection of domestic industries against low-wage foreign labor "a selfimposed blockade."

The report suggests the alternative of a leasing system for mineral deposits on the public domain, leaving it up to the individual prospector to determine whether he wishes to lease the mineral deposit or to acquire it by location and patenting of claims. Under such a leasing system a mineral enterprise would be granted an exclusive prospecting permit carrying a preferential right, in the case of discovery, to lease an agreed part of the area on terms and conditions established before exploration was begun.

Current percentage depletion allowances are approved as an inducement to risk capital and it is recommended that present limitations on the amount of permitted expensing of exploration costs be removed.

Commenting that the incentive device seems particularly adopted to the mineral industries, the Commission recommended legislation which would give financial assistance to small mining operations seeking new deposits of strategic minerals—the amount to be approximately \$15 million over five years. The Report favors long-term contracts and standing purchase offers for domestic production of scarce minerals. Premium price plans, the Report remarked, are useful under special emergency circumstances, but are not adapted for use as part of a long-range price policy. On acquiring minerals from abroad, the Report suggests creation of a permanent Commission to make long-term purchases, including price guarantees, with resource nations; and to make loans for foreign materials production, where special security interests justify assumption of risks beyond those assumable by the Export-Import

The Commission would have a complete census of the minerals industry taken every five years and would have the U.S. Geological Survey speed up geological mapping of the U.S. and Intensified programs are recommended for research to improve exploration methods, with Government, universities and private industry cooperating. Early initiation of the St. Lawrence Seaway is recommended. The Report goes on record for continuing the study of synthetic liquid fuels production, with limited Federal financial assistance to private companies undertaking production; likewise recommended are advance of coal technology by research programs and rapid development of the country's hydroelectric potential.

The Commission expresses its conviction that "the solutions to the prob-

(Continued on page 73)



Committee members present included (clockwise around table): A. E. Seep (not shown in picture), W. J. Coulter, W. W. Mein, Jr., A. C. Harding, L. J. Randall, J. D. Conover, O. Herres, J. C. Fox, M. W. Bowen, H. A. Walker, R. G. Sullivan, R. S. Palmer, J. P. Harrison, A. J. O'Connor, C. H. Steele, and O. H. Johnson

## Program Committee Meets in Denver

#### Plans Shape Up for Mining Show in September

AT committee meetings in Denver last month plans were formulated for the 1952 Metal and Nonmetallic Mineral Mining Convention and Exposition, to be held September 22-25 in the recently enlarged City Auditorium. A program was drawn up to provide the thousands who come to Denver in September with full coverage of major legislative, economic and operating problems faced by the entire mining industry. From every part of the country State Chairmen of the Program Committee converged on the mile-high city to attend the meeting called by National Committee Chairman Otto Herres.

It was their task to choose, from the numerous suggestions submitted by 187 committee members and others, the topics and speakers best calculated to answer the questions uppermost in the minds of metal and nonmetallic mineral mining men.

Among the subjects to be considered at the September meeting will be the over-all outlook for the mineral industry, defense production and expansion progress, future mineral policy generally, and the special problems of the thousands of small mines. Especially timely and interesting will be addresses and panel discussions,

with outstanding congressional and industry leaders, on such matters as taxation, public lands, wage stabilization and labor relations, subversive activity, and the future of Government controls. Gold, silver and monetary policies, as well as atomic energy and uranium mining, will also command widespread attention.

No operating man will want to miss the sessions dealing with cost reducing improvements in drilling equipment and methods, current trends in the mechanization of underground mining, shaft sinking, and roof support. A strong session on latest practices and equipment in open-pit mining will be on the program and two sessions will be devoted to milling and metallurgical progress. Special attention will be given to new and improved techniques and equipment used in the search for new ore bodies and extensions of old ones.

In addition to the general and operating sessions, there will be a number of special conferences dealing with problems of paramount interest to more limited groups. The vital interest of the subject matter and the caliber of the authorities who will speak on the topics chosen, insure a Convention second to none in appeal

and value to the entire mining industry.

#### **Exhibition Plans Progress**

Displays of every kind of mining equipment and supplies will fill the newly enlarged City Auditorium and two large parking lots outside. In recognition of the value of these exhibits, the Convention program will be arranged so Convention-goers can have ample opportunity to study the units on display, and to discuss their problems with the manufacturers' representatives who will be on hand for that purpose.

Full descriptions of these exhibits will appear in the big August Pre-Convention issue of MINING CONGRESS JOURNAL. Over 43,000 net square feet of exhibit space will be occupied by every kind of mining and milling equipment and supplies. The newest drills, the latest in ore haulage vehicles and the ultimate in milling and metallurgical machinery will vie for the visitors' attention with interesting displays of auxiliary service items and the supplies mining men need in order to extract the longest life and use, with maximum safety, from their equipment.

The exhibits make the Mining Show an advanced course in modern metal and mineral extraction. No one in the business can afford to pass up this unparalleled opportunity. Every one of the thousands attending the Convention should plan to spend all possible time in the Exposition halls. Every man, whether he be mucker, manager or mine owner, will go away full of new ideas on how to do a better, safer job of getting out the raw materials so important to maintaining the American economy in these crucial times.

#### **Lighter Moments Too**

Conventions, no matter how interesting and valuable their serious moments, would be dull indeed if there were no time for relaxation and fun. To provide these, elaborate plans are being executed to see that Conventioneers are well entertained. The social side of Convention Week will get off to a bang-up start with the traditional Miners Jamboree on Monday night, for which Denver's beautiful Rainbow Ballroom has been reserved. Starting at 6:00 P.M. there will be refreshments guaranteed to put everyone in a lively mood. A delicious buffet supper will be followed by dancing to the tunes of a well-known orchestra. A floor show featuring top-notch performers will be presented and more music and dancing will round out the gala event.

Tuesday and Wednesday evenings have been left open for private parties and visiting, renewal of old friendships and the making of new ones. Denver and its environs have plenty to offer in the way of eating places and entertainment spots. No miner, in for the Convention, will be at a loss for something to do on these two "open" nights.

Thursday is the traditional night for the speechless banquet which climaxes the Convention's social activities.

Mining men and their ladies are all



Resurrection No. 2 Shaft to be visited on the Climax, Leadville, Gilman trip

invited and urged to order their tickets for all the entertainment features and trips in advance. Order blanks, etc. will go out to the industry shortly.

#### For the Ladies

In addition to a cordial invitation to share in all the other events of the Convention, the ladies will enjoy a special program of daytime events being planned for them. These will include a tea and reception, a fashion show and luncheon and a sightseeing trip with luncheon served at one of the famous mountain resorts near Denver.

#### Field Trips Planned

Denver is the center of a whole mining empire. To enable visitors to take advantage of the unusual opportunities offered by the region a series of seven field trips has been scheduled. One of these, a trip to the Colorado School of Mines and Research Institute at Golden, will take place on Sunday, September 21 from about noon to 4:30. All the others-three by air and three by bus-start on Friday, September 26. These trips will cover such famous and interesting places as Rifle and the Colorado oil fields, the Colorado Plateau uranium mines around Grand Junction; mines in the neighborhood of Ouray; the Climax, Leadville, Gilman District; the historic Cripple Creek District, and a trip to the steel plant of the Colorado Fuel and Iron Corp. at Pueblo.

These trips provide, in addition to the opportunity to see some of the largest, most efficient mines, mills and metallurgical plants in the region, some of the most inspiring scenery in the West.

Tickets for all events and the field trips should be purchased well in advance of the meeting and will be forwarded by registered mail in plenty of time.

Requests for housing accommodations—being handled by the Denver Convention and Visitors Bureau—have been coming in for over eight months. Those who have not already made reservations should write or wire immediately to the Housing Committee, Denver Convention and Visitors Bureau, 225 West Colfax Ave., Denver, Colo.



Colorado Fuel & Iron Works steel mills at Pueblo will be goal of one interesting field trip

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At the annual meeting of the United States Smelting Refining and Mining Co. on May 21, W. C. Page, vice-president and general manager of western operations, was elected a director to fill the vacancy caused by the death of F. F. Colcord.

The Board of Directors of the National Coal Association at its recent meeting elected L. C. Campbell, of Pittsburgh, Pa., as president of the

Association, and Tom Pickett, a member of Congress from Texas, to the post of executive vice-president.





mittee for many years, is vice-president of the Coal Division of the Eastern Gas and Fuel Associates in

charge of their extensive mining operations in West Virginia, Pennsylvania and Kentucky. He is also chairman of the Coal Division of the American Mining Congress. As president of the Coal Association he suc-



Tom Pickett

ceeds Ralph H. Knode of Philadelphia, chairman of the board of the Stonega Coke & Coal Co. and a senior officer of the Westmoreland Coal Co., who has been president of the Association for the past three years and who declined reelection.

Congressman Pickett-a native of Texas and a lawyer by profession, who has served in the House for the past eight years-succeeds John D. Battle. Battle, who has reached retirement age, will continue active in the Association's affair at the invitation of the directors and is assuming the newly-created post of assistant to the president.

James R. Love has been elected vice-president of West Kentucky Coal Co., and vice-president and general manager of the St. Bernard Coal Co. His election took place at the recent meeting of the Board of Directors of West Kentucky Coal Co. and its wholly owned subsidiary St. Bernard Coal Co.

Laurence T. Eck has been appointed plant manager of the cobalt metal refinery now under construction on National Lead Co.'s property at Fredericktown, Mo. G. Edward Peters has been named plant superintendent for the operation.

L. B. Franklin has been elected vicepresident of Southern Coal Co. Inc., and a member of the Board of Directors, according to an announcement by Ted L. Kelce, executive vice-presi-

Allison Butts, professor of electrometallurgy, on June 4 was named head of the department of metallurgy at Lehigh University. The promotion, announced by President Martin D. Whitaker, will become effective August 1. He will succeed Dr. Gilbert E. Doan, who will leave the faculty to join the staff of the Koppers Co.

It was recently announced that Daniel J. Carroll of Beckley, W. Va., has been appointed as a commodity analyst in the equipment and material division of the Defense Solid Fuel Administration.

According to DSFA Administrator Charles W. Connor, Carroll will give particular attention to priorities for machinery and equipment for the coal industry. From 1947 until late 1951 Carroll was chief of the fuels branch of the Department of the Army's Pacific headquarters in Tokyo, Japan.

Ernest F. Bean, Wisconsin State geologist, retired June, 1952, after a long career devoted to the interest of the mineral resources of the state of Wisconsin. He had held his position since 1925. One of his chief duties as state geologist has been assisting in the evaluation of iron mines for the Wisconsin Tax Commission.

Several promotions in the zinc mines of Tennessee Coal and Iron Division of U. S. Steel Co. have been announced. E. B. Jennings, general superintendent, has been assigned special duties with TCI's raw materials department. Jennings has been succeeded at the Jefferson City, Tenn., operations by Frank B. Brophy who advances from assistant general sunerintendent.

In other promotions at the zinc mines, J. O. House was appointed maintenance superintendent; Joseph A. Miller was made mine superintendent and Samuel K. Mynatt was promoted to mining engineer.

The newly created post of safety and ventilation inspector goes to W. A. Quisenberry.

E. F. Miller, formerly assistant manager of Compania Carbonifera de Sabinas, a totally-owned subsidiary

of American Smelting and Refining Co. has been appointed vicepresident charge of West Virginia coal mines and properties of the Westmoreland Coal Co. From 1947 until June 1952 Miller managed coal



mines for the American Smelting and Refining Co. at Rosita in the State of Coahuila, Republic of Mexico.

Earl R. Maize resigned from National Coal Association on June 15, 1952, to become general manager of operations for the Sheridan-Wyoming Coal Co., Monarch, Wyo. Maize came to National Coal from the U.S. Bureau of Mines where for twenty years he supervised safety work, research and did recovery work following mine fires and explosions.

Robert E. Henderson, who was formerly mine superintendent at Climax but left the company in 1948, has been reemployed as general superintendent at Climax.

Leonard Sargeant has retired as president of the Fairmont Machinery Co., effective March 31, 1952, after 31 years of association with the company. A severe heart attack early in August of last year forced Mr. Sargeant to take this step.

He was a pioneer in the field of coal preparation and contributed much to the tremendous growth of that industry during the span of his business He is widely known throughout the bituminous coal industry where his hundreds of friends will regret to learn of his retirement.

A. B. Parsons has resigned as director of the Program Development Division of the Defense Materials Procurement Agency in Washington to return to his home in Oakland, Calif. He has spent the last 18 months in Washington with DMPA and its predecessor DMA.

He will continue to act as a consultant to DMPA and related agencies with headquarters at 555 Battery St.,

San Francisco.

C. Robert Angove has been named assistant training superintendent of the Industrial Relations Department of Eastern Gas and Fuel Associates, at Mount Hope, W. Va.

John P. Courtright was recently elected president of the Marion Power Shovel Co. of Marion, Ohio. He succeeds Harvey T. Gracely who is forced



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by illness to assume an inactive status except for possible special assignments.

At the same time, J. Malcolm Strelitz was elected chairman of the board, Adrien F. Busick, Jr. vice-president in charge of en-

gineering and Maurice V. Cornell vicepresident in charge of sales. David E. Rizor was named assistant to the president in matters pertaining to sales and services.

Louis Ware, president of International Minerals & Chemical Corp., received a Doctor of Science degree at the Commencement exercises of the University of Kentucky May 30. Ware was born in Somerset, Ky., and graduated from the College of Mining Engineering at the University of Kentucky in 1917.

With more than 35 years of experience in anthracite and bituminous-coal mines, Seth T. Reese, mining engineer in the Health and Safety Division of the Bureau of Mines, United States Department of the Interior, has been named Chief of the Accident Analysis Branch in the Washington office. Reese succeeds Forrest T. Moyer who transferred to the Central Intelligence Agency.

The election of Gustav Laub as a director of Vanadium Corp. of America was announced recently by William C. Keeley, president. Laub has been associated with the company for the past 37 years, and as vice-president in charge of sales for the past four years.

#### — Obituaries —

William Harold Hoover, president of the Anaconda Copper Mining Co., died in Butte, Mont., on June 6 at the age of 63. He died at his home following a year's illness.

Mr. Hoover had been president of Anaconda since 1949. He had been



vice-president since 1943 and a director since 1947. He joined the company in 1914 as associate counsel for Anaconda's offices in Great Falls, Mont.

Although Mr. Hoover was born in Lodi, Ohio, he had made Montana

his home for 40 years. He received an A.B. degree from Wooster University, earned his law degree at Harvard University in 1913, and was admitted to the practice of law in Montana the following year.

Among his many other company affiliations he was president and director of Andes Copper Mining Co., Basic Magnesium, Inc., Chile Copper Co., and Chile Exploration Co. He was a director of the American Mining Congress and had served long and well in this capacity.

The entire mining industry mourns the passing of Mr. Hoover. He will be missed for a long time to come.

Charles K. King, chairman of the board of The Ohio Brass Co., died May 31, at his summer home in Edgartown, Mass.

Born in 1867, Mr. King was grad-



uated from Calais Academy, Calais, Me., and attended Johns Hopkins University where he obtained a degree in electrical engineering. Prior to joining Ohio Brass, Mr. King was affiliated with the Northwest Thompson

Houston Co. and, later, with the Ansonia Electric Co.

A pioneer in the electric railway industry, Mr. King had been affiliated with Ohio Brass Co. since 1893 when he joined the company as an electrical engineer and sales manager. In the intervening years he served successively as secretary, vice-president, president and general manager, and chairman of the board.

John Lester Perry, who was president successively of United States Steel's Tennessee Coal, Iron and Railroad Co.; Carnegie-Illinois Steel Corp., and Columbia Steel Co., died May 27, 1952, in Pittsburgh, Pa.

Mr. Perry, who was 71, retired from active service on November 15,

On July 11, John L. Clarkson, president and general manager of Clarkson Manufacturing Co., died at his home in Nashville, Ill.

Joseph W. Mullalby, 54, manager of utility sales for Anaconda Wire and Cable Co. died on June 10. Mr. Mullalby, a native of St. Louis, Mo., was White House Aid to President Calvin Coolidge. He joined Anaconda Wire and Cable Co. in 1930.

Jessel L. Whyte, 61, president and general manager of the Macwhyte Co., died on May 28, following a prolonged illness.

Mr. Whyte started his career with



Macwhyte Co. in 1905 when the plant was located in Coal City, Ill. After studying in England and serving an apprenticeship in Scotland he returned to Macwhyte, now located in Kenosha, Wis., as a foreman in the

wire mill. He progressed steadily through the firm to be named president and general manager, the position he held at the time of his death.

Sumner Cottingham, 80, former president and treasurer of the Ohio Mining Co., died recently in Columbus, Ohio. He was once director of the Ohio Coal Association, and had operated coal mines in Ohio and West Virginia.

Arlington E. Stanton, vice-president of the American Zinc, Lead and Smelting Co., St. Louis, Mo., passed away after a short illness at St. Anthony's Hospital, St. Louis, June 10.

Mr. Stanton was well known throughout the zine, mining and smelting industry for 46 years. In 1906 he was employed by Lanyon Zinc Co. at Caney, Kans., as bookkeeper and auditor. When this company was acquired by American Zinc in 1906 Mr. Stanton joined American Zinc in a similar capacity. In 1941 he was elected vice-president of the American Zinc, Lead and Smelting Co., in which capacity he served until his death.

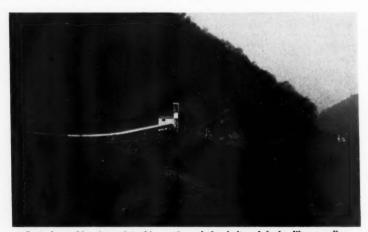




#### **Beltroad Opens New Area**

Twenty-eight thousand ft of rubber conveyor belt is being used to transport coal from mine to river tipple. Otherwise the coal would have to be trucked over seven miles of treacherous mountain roads. The beltroad is bringing coal out of the Kanawha River Valley near Charleston, W. Va., and depositing it at a river tipple on the Kanawha River, near Montgomery, W. Va., 14,000 ft from the start of its ride. All in all, the system is composed of nine flights, or sections, of

rubber conveyor belt. These range in length from 230 to 3770 ft pulley to pulley distance. The spectacular downslope belt of the conveyor system, in six months' operation, has moved 125,000 tons of coal from mine to stockpile while awaiting completion of the main line conveyor legs to the river. The downslope belt is 42 in. wide, cord-reinforced and can handle 350 tph. Eight remaining belts in the system are 36-in. wide, can handle 550 tph. Belting for this new installation has been furnished by the B. F. Goodrich Co., Akron, Ohio.



Seen from this viewpoint, this section of the beltroad looks like a roller coaster as it threads itself around the mountain. Steel towers supporting the conveyor system are as high as 30 ft at some points and are anchored in solid rock. Excavation to level the belt route was not attempted because of constant threat of landslides

#### Freeport Prospects in Maine

Freeport Sulphur Co. is prospecting for iron sulphide in a 421,000-acre tract in the Moosehead Lake region of Maine. Mineral rights on this huge tract, made up of three separate properties, have been granted to Freeport on a royalty basis by the Hollingsworth & Whitney Co., the Great Northern Paper Co., and the Penobscot Development Co.

Freeport has two years to explore for iron sulphide minerals which may occur in association with certain basic rocks which have been generally outlined by an aerial magnetometer survey. This survey was completed in the summer of 1951 as a joint project between the Maine Development Commission and the United States Geological Survey. Commencing in 1954 Freeport must make royalty payments to the three owning companies.

#### **Foote Acquires Lithium Deposit**

Foote Mineral Co. has purchased surface rights to approximately 37 acres of land adjoining their Kings Mountain holdings in North Carolina. This acquisition will add reserves to the deposits of high-grade spodumene which the Foote Co. is currently mining at this location. Spodumene 13 a basic raw material for the production of lithium chemicals.

#### Close Powellton No. 6

Operations at the Powellton No. 6 mine, Powellton, W. Va., of Eastern Gas and Fuel Associates ended with the close of the work week of March 28. Production had been gradually reduced over a considerable period of time and many employes have been transferred to other EGAF operations.

This mine was one of the oldest and most productive in Fayette County, W. Va., and was first opened in 1885 by the Mount Carbon Co., Ltd., London, England.

#### **New Coal Horizon**

Another industrial use for bituminous coal has been introduced with the opening of a plant in Institute, W. Va., to produce chemicals through hydrogenation, a process in which coal is pulverized and combined with hydrogen under extreme pressure. The process is not new, having been used for some years as a method of producing gasoline, but this is the first time that it has been proposed to employ it with chemicals as the primary objective.

Eventually, hydrogenation could conceivably supplant carbonization as the foremost source of valuable coal derivatives that include explosives, sulfa drugs, plastics, nylons, and scores of other items in peacetime and wartime. In carbonization, the chemicals come from vapors and tar that are distilled in ovens where the coal is baked without air to produce coke for steel mills. But the markets for chemicals have in some cases greatly outweighed supply, particularly with respect to benzene, toluene, and other substances that have been in heavy demand since the beginning of the war in Korea.

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URNAL

Actually, Carbide's "chemical factory" is considered a pilot plant intended to pioneer developments from which an entirely new industry will arise, yet its processing of 550 tons of coal daily is expected to make the plant a sound operational investment.

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JULY, 1952

#### Extra Advantages at No Extra Cost



MINE locomotives and shuttle cars withstand hard usage because they are of high-strength steel construction. Why not give them storage batteries of the same construction?

In Edison Nickel-Iron-Alkaline Storage Batteries, steel cell construction brings you high strength to withstand abuse and prevent down-time.

Edison batteries give you the further advantage of not requiring critical adjustment of the charging rate. In fact, they can be charged through suitable resistors direct from the d-c power supply. They consistently withstand the irregular charging conditions in combination locomotives.

Then, too, they are electrically foolproof. They are not injured by accidental short-circuiting or even reverse-charging . . . by standing idle during shutdowns . . . or by freezing.

Yet you get all these advantages at no extra cost. On the contrary, Edison Nickel-Iron-Alkaline Storage Batteries are so long lived that they effect substantial savings in annual depreciation charges. They are so trouble-free that they cut maintenance costs too. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. Thomas A. Edison of Canada, Limited, Montreal.



Curaway view of a typical cell used in batteries for mine haulage. High-strength steel construction is used in all cells.



#### The President's Conference on Industrial Safety

The third annual meeting of the President's Conference on Industrial Safety was held in Washington, D. C., June 2, 3 and 4, 1952. Organized in 1948 at the request of President Truman, with the purpose of mobilizing the safety resources of America to save human lives in industry, the first full-scale conference was held in March, 1949. This brought together some 1200 representatives of labor, management, Federal and State government officials, educators and leaders of private organizations all having a direct interest in promoting industrial safety. The movement thus started, has gained momentum. All branches of industry now collaborate in developing safe practices and methods of preventing fatalities and injuries to industrial workers.

The 1952 conference was opened on Monday morning by the Hon. Maurice J. Tobin, Secretary of Labor, by presenting President Harry S. Truman, who said in part:

"At my first meeting with you in March of 1949, I proposed that we try

to reduce the rate of job accidents by one-half within three years. That was a high goal. But, until the outbreak of hostilities in Korea, we were making good progress. Then, due to our defense program, thousands of new workers were brought into defense plants and other industries. Thousands of other workers shifted to new jobs. With these changed conditions, the number of work accidents began to increase. They increased four percent in 1950 and another nine percent in 1951. This increase is a very serious matter. We must do everything we can to stop it. We must see to it that the accident rate starts down hill again, and that it keeps on going down.

"To accomplish this, I believe the Nation should have an eight-point industrial safety program-a program based upon recommendations which have been made by this conference: First, accident reporting and analysis should be improved; Second, manufacturers of machines should install better guards: Third, schools, colleges and plants should emphasize safety education: Fourth, every company should have an organized safety program; Fifth, workers should participate more extensively in safety measures; Sixth, State safety codes should be modernized and made uniform; Seventh, public employes should have better safety programs; Eighth, there must be better public understanding and support of accident prevention. . . ."

At the succeeding sessions on the following two days there were a number of addresses on various phases of safety presented by industrial leaders. Among these speakers were Ned H. Dearborn, president, National Safety Council; Ivan F. LeGore, manager, Accident Prevention Bureau, Portland Cement Association; Harry W. Anderson, vice-president, General Motors Corp.; J. Carlisle MacDonald, assistant to chairman of the board, United States Steel Co.

#### Miles of Track Underground

The State Planning Board of the Department of Commerce of the Commonwealth of Pennsylvania has stated that permanent underground railroads of the anthracite and bituminous coal mines of that state total about 3000 miles. In addition, every year 6500 miles of temporary rail is laid.

The Eastern Railroad Presidents Conference reports that the total railway line mileage in Pennsylvania amounts to 9726, third highest state in the nation. Thus the coal industries' underground rail system approximates the length of that of the surface roads.

## This Door has saved countless lives... increased production by millions of tons...

Engineered flow of air sweeps out gas pockets, and air flow must be continuous, reliably directed by "Canton" Automatic Doors. Dissipating explosive air is one important function. Providing healthy, breathable air is another function that steps up productivity of every worker. Eliminating that trapper boy accident is another.

Insurance against accidents, increased haulage, continued speed ahead with "Canton" Automatic Doors make it imperative that every mine owner and manager investigate the economy proven by a quarter century of American Mine Door service.

#### "CANTON" DOORS ARE SELF LIQUIDATING IN A SHORT PERIOD

Note the photos... when the oncoming train rides the trip levers... flip, the doors open; when the last car passes... release, the doors spring shut... positive action and reaction... all mechanical in split seconds. Complete literature sent on request, engineering advice given without obligation. When writing, please use street and zone number.

## or Company

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## American Mine Door

"Dustributors" Automatic Switch Throws
Safety Signal Systems Mechanical Track Cleaners

#### West Virginia Miners Meet

The West Virginia Coal Mining Institute and the Central Appalachian Section, AIME, held a joint meeting in Huntington, W. Va., on June 20 and 21. This was the annual summer meeting of the group.

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Exceptionally timely and interesting papers were presented at the three technical sessions. Acel Garland, director of Industrial Engineering, Island Creek Coal Co., discussed the application of industrial engineering to coal production. He pointed out that time studies and cost control are an integral part of any well run mining operation. Although most coal companies use these tools, Mr. Garland felt that even more work can be done along these lines.

Dr. Henry F. Hebley, research consultant, Pittsburgh Consolidation Coal Co., described what is being done by legislative bodies in the various states to force stream purification within these states and the problems that confront coal mining in the field of stream contamination.

"The Properties of Coal-Their Influence on Performance of Coal Burning Apparatus" was the title of the paper given by B. E. Tate, chief engineer of power plant, National Cash Register Co. Mr. Tate pointed out that two very important properties of boiler coal are uniformity of size and the swelling index. To improve service to the consumer, he said that all coal salesmen should be furnished with this information, and all too often are not.

Dr. A. J. W. Headlee, chief chemist, West Virginia Geological Society spoke on "Germanium and Other Elements in Coal Ash and the Possibility of Their Recovery." Estimates indicate that in 1956 the demand for germanium will reach 40,000 lb as compared to the 1951 production of 6000 lb. Germanium occurs in the top and bottom of a coal seam, principally, but not in large enough quantities to mine coal for the element only. According to Dr. Headlee samples from 16 coal seams gave an average of 0.013 percent germanium dioxide in the coal ash. Some of these ashes also assayed over \$5 per ton in silver.

Much interest was shown in Dr. H. S. Turner's paper on hydraulic transportation of coal. Dr. Turner is a director, Research and Development Division, Pittsburgh Consolidation Coal Co. He described work being done by Pittsburgh Consol to determine the practicability of transporting coal by pipe line. He said that the present experiments will probably end this year, and have so far indicated an applicability for this type of transportation to certain markets.

F. R. Zachar, general superintendent, Christopher Coal Co., spoke on the effect of Sewickly seam mining on

later Pittsburgh seam mining. The Pittsburgh seam lies below the Sewickly. His paper was discussed by C. H. Williams, assistant chief engineer, Red Jacket Coal Corp., and Ben Lazier, Pocahontas Land Corp.

Dr. Stewart H. Smith, president, Marshall College, spoke to the luncheon guests on the subject of "Educa-tion Under Fire." Those attending the dinner heard J. D. A. Morrow, Joy Manufacturing Co., speak about, "A Quick Trip to Europe and a Look Back at this Country through the Eyes of a European Businessman.'

#### Pocahontas Fuel Expands

Plans of the Pocahontas Fuel Co., Inc., coal producers and shippers, to acquire the George W. Pickering Co., New England fuel and appliance distributors with headquarters in Salem, Mass., were approved May 29 at a meeting of Pocahontas shareholders, it was announced by Armstrong R. Matthews, Pocahontas president.

Horace E. Davenport, president of the Pickering Co., has been named vice-president in charge of New England operations. The Pickering firm, a century-old concern, will continue operations under its own name.

Mr. Matthews stated that in the merger of the two firms, Pickering stock will be exchanged for shares in Pocahontas.



Richard Ray Shockley (right) of Blusfield wins Old Timers award for being an outstanding student in coal mine engineering at the Virginia Polytechnic Institute. The award was presented by S. M. Cassidy, president, Consolidation Coal Company (Ky.), at the annual dinner of the Burkhart Mining Society, Student Chapter of the AIME, in Blacksburg, Va.

#### Strip Mine Abandoned

The Penowa Coal Co. has announced its abandonment of a strip pit in Brook County, W. Va., and its str p mine near Burgettstown, Pa. The firm, third largest in the area, had produced some 7700 tons daily. Rising prices and fierce competitions were blamed

#### BARGAINS IN GOOD USED EQUIPMENT

ELECTRIC MINE HOISTS

1—500 HP Wellman-Seaver-Morgan Double Clutched Steel Drum Slope Hoist.
Will spool 2000° of 1½ "rope.

1—400 HP Victan Double Clutched Drum Hoist. Will spool 5000° of 1½ "rope. Contracting external clutches, Herringbone gears, Lilly safety control, air brakes.

1—600 HP Mordberg Single Drum Hoist. Will spool 5000° of 1½ "rope.

1—400 HP Ottumwa Single Drum Hoist. Will spool 5000° of 1½ "rope.
All of these Hoists have 3 phase, 60 cycle, 2300 volt motors, centrols and all necessary appurtenances.
We have all types of Hoists with 100 to 1500 HP motors, suitable for slope, shaft and drift mines. Complete specifications on request.



1-300 KW General Electric

4-200 KW General Electric 1-100 KW General Electric

6-14-BU-3PE Joy

6-11-BU Joy

6-8-BU Joy

10-7-BU Joy

4-14-BU-7RBE Joy

2-250 KW West. Mine Type Rectifiers

LOADING MACHINES, 250 VOLT DC

5-460 Goodman

2-360 Goodman

4-260 Goodman

5-L-600 Jeffrey

2-L-500 Jeffrey

TROLLEY LOCOMOTIVES, 250 VOLT DC. BALL- ROTARY CONVERTERS-TYPE HCC-6, 275 V. 1200 BEARING

BEARING
2—20-ton Jeffrey MH-77
2—15-ton West. 908-C
2—15-ton Geodman 36-A
5—15-ton Jeffrey MH-110
4—13-ton G. E. HM-827
2—13-ton Jeffrey MH-110
1—10-ton Jeffrey MH-10
1—10-ton Geodman 34-B
12—8-ton Jeffrey MH-100
3—8-ton G. E. HM-819 with reels
4—8-ton West. 905-C with reels
4—8-ton G. E. HM-834 with reels
15—6-ton Jeffrey MH-88 with reels

Track gauges 24" to 42". Complete with new Jeff-rey steel strip resistances. All have been rebuilt and any part showing any wear was replaced with new.

BATTERY LOCOMOTIVES 4-, 5-, 6-, and 8-ton 24" to 36" track gauge Battery Locomotives with good batteries. Just taken out of service.

MOTOR GENERATOR SETS, 275 V. 1200 RPM, 2300/4100 V

1—300 KW West., full automatic switchgear 1—300 KW G. E., full automatic switchgear 4—200 KW G. E., full automatic switchgear 3—150 KW G. E., manual switchgear

MISCELLANEOUS

1-16" Superior McCully Gyratory Crusher, complete with 100 HP motor and V-Belts, used only three

2-Myers-Whaley No. 3 Automats, practically new.

CABLE REEL AND BATTERY SHUTTLE CARS-

1-Model R-32 Athey Crawler Type Rear Dump Trailer, 13 cu. yd. capacity, 8.5 cu. yd. water

2—McKinlay Entry Drivers, practically new, with \$17,000.00 worth of brand new parts and supplies.

Complete specifications on any of the above equipment on request.

All types of equipment for coal, metal, potash and salt mines. Mail us your inquiries for hard-to-find equipment.

#### COAL MINE EQUIPMENT SALES COMPANY

SHELDON J. WOLFE FRANK J. WOLFE Since 1912 306-307 BEASLEY BLDG .- LONG DISTANCE PHONE 34-TERRE HAUTE, INDIANA

RNAL

#### **Pitt-Consol Increases Output**

Company mines of the Pittsburgh Consolidation Coal Co. produced 27,079,000 tons in 1952 as compared with 24,030,000 tons in 1950. Over one-third of the 1951 tonnages went to utilities taking up some of the slack left by decreased requirements for railroad fuel and home fuel in the recent years.

#### **Establish Cement Scholarship**

Lehigh Portland Cement Co., Allentown, Pa., with a gift of \$15,000 has established and endowed an undergraduate scholarship at Princeton University open to any qualified student in any one of the university's department of studies. The fund will be known as "Lehigh Portland Cement Co. Scholarship" and will return sufficient annual income to cover the full cost of an undergraduate's tuition for an academic year. There is but one stipulation in making awards for this scholarship: that it be used solely and exclusively for providing tuition for undergraduate students in the engineering or liberal arts departments.

#### Expand Production At No. 14

Production at mine No. 14 of the U. S. Steel Co. will be increased to 10,000 tons a day from the present 4000 tons daily output. The mine, located at Munson, W. Va., produces coal from two seams.

#### **Coal Company Elects**

The annual meetings of the shareholders and directors of The Lorain Coal & Dock Co. and The Lorado Coal Mining Co. were held at the general offices of the companies, 33 North High Street, Columbus, Ohio, June 9, 1952.

Directors for the coming year for The Lorain Coal & Dock Co. are: S. B. Johnson, Columbus; E. N. Saunders, Jr., St. Paul, Minn.; Judge Allen B. Hannay, Houston, Texas; A. C. Saunders, Jr., and J. R. Johnson, Cleveland; J. M. Rankin, Columbus; E. N. Saunders, III, St Paul, Minn.; S. B. Johnson, Jr., Columbus; and F. A. Burke, Cleveland.

Directors for The Lorado Coal Mining Co. re-elected were: S. B. Johnson, E. N. Saunders, III, A. C. Saunders, Jr., J. R. Johnson and J. M. Rankin

The officers who were re-elected at the Directors Meeting for The Lorain Coal & Dock Co are as follows: S. B. Johnson, president; A. C. Saunders, Jr., vice-president; J. R. Johnson, vice-president; R. L. Seith, secretary-treasurer; and L. K. Moench, assistant secretary-treasurer.

For The Lorado Coal Mining Co. the officers re-elected were: S. B. Johnson, president; J. R. Johnson,

vice-president; R. L. Seith, secretary-treasurer; and L. K. Moench, assistant secretary-treasurer.

#### **Gone to Camp**

Children of employes of Eastern Gas and Fuel Associates began going to summer camp June 23. This was the date that the coal company opened the first of its summer camps, Camp Lightfoot near Hinton, W. Va. By the end of the summer the company will have played host to about 1000 boys and girls who will have spent two weeks at one of the completely equipped camps that Eastern Gas and Fuel operates for children of employes.

#### **Build New Bureau Station**

Award of a contract for building a new Bureau of Mines experiment station at Morgantown, W. Va., was announced June 12, by Secretary of the Interior Oscar L. Chapman.

By approving the contract for the construction of buildings, driveways and other facilities, Secretary Chapman authorized the start of the largest construction job yet carried out by the Bureau of Mines, except for the synthetic liquid fuels facilities. The authorized cost of the station is \$2.600.000.

The principal activities initially planned for the station, J. J. Forbes, Director of the Bureau of Mines, said, include: (1) Research on the production from coal of synthesis gas, which

may be used to produce liquid fuels, ammonia, alcohol, and other chemicals; (2) Headquarters for mining studies and health and safety work now carried on in rented quarters at Fairmont, W. Va.; and (3) Headquarters for the Bureau's petroleum and natural gas research in the Appalachian region.

The site of the new station is a 45-acre tract on the Collins Ferry Road, just outside the corporate limits of Morgantown. Through the efforts of a Morgantown Chamber of Commerce committee headed by Dr. Paul H. Price, West Virginia State geologist, this tract was donated to the Government.

#### Anthracite Research Needed

The need for research by the anthracite industry to develop equipment for new housing was cited by Dr. Raymond C. Johnson, vice-president of the Anthracite Institute, when he addressed more than 200 delegates attending the third session of the tenth annual Anthracite Conference at Lehigh University, in May.

"Changing conditions in design and materials of home construction make it necessary to continue research," he said, "in order to keep abreast and compete with heating by other fuels. Modern units are economical, efficient, clean, convenient, and operate with a minimum of mechanical trouble which overcomes the objections to the earlier types of solid fuel heating equipment."

#### Operating With Jeffrey Colmol

(Continued from page 50)

the present face penetration per minute with permissible horsepower requirements and also produce a product with size consist comparable to that of conventional mining.

#### **Severe Conditions Met**

Headings being driven by the Colmol at the end of March advanced into an area where the seam contains a large number of "sulphur balls," an unusual condition in the Sewickley Seam. These "sulphur balls" became so numerous that continued operation of the Colmol would result in the prohibitive bit cost of 70 cents per ton. These headings were put back on conventional off-track mechanical mining and the Colmol moved to a new section.

Continuing these headings with conventional off-track mining gave an additional insight into the advantages of continuous mining in the Sewickley Seam. This seam is beset occasionally by a roof condition known locally as

a "cutter." These "cutters" can develop in what appears to be absolutely solid sound roof and within minutes cause an entry to fall in for several hundred feet. The name "cutter" is derived from the ripping action, usually along the rib, that progresses slowly but surely down the entry. Steel timbers, conventional wood cross-bars, posts, and even cribs have proven unsuccessful in stopping the cutter action short of its natural stopping point. Roof bolts, however, have been fairly successful in retarding and even stopping cutters. It has been found that "cutters" occur most frequently in places driven on the face. Prior to April, 1952, five headings each 5600 ft long had been driven with the continuous unit on the face without a cutter or roof fall occurring. After going to conventional mining, and therefore blasting, a small cutter and some bad roof had developed within 180 ft. It is the belief of those connected with this operation, though not necessarily substantiated by the above, that continuous mining does not contribute to bad roof as does the blasting of bottom cut coal in conventional mining.



#### St. Joe Expands Activities

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Trustees of the St. Joseph Lead Co. have approved amendments to the company's certificate of incorporation extending the purpose and power of the company to include in its operations oil, natural gas and mining operations of all types.

The company now plans to enter into contracts to drill 15 exploratory oil wells in Texas, Louisiana, California, Oklahoma, Wyoming, Montana, Colorado and southern Illinois.

#### I.M.I. Meets October 24

The 60th annual meeting of the Illinois Mining Institute is to be held at the Hotel Abraham Lincoln, Springfield, Ill., on Friday, October 24. The football game, always a big attraction at these get-togethers, at Champaign, Ill., on Saturday, October 25 is between Illinois and Purdue.

#### **Insulated Barges for Sulphur**

Three of six insulated steel tank barges with which Freeport Sulphur Co. will transport molten sulphur from new deposits in the remote Louisiania marshland have been launched.

They are the largest tank barges ever built. Two will carry liquid sulphur from Bay Ste. Elaine, which will be mined with an "amphibious" plant starting this fall, to storage at Port Sulphur, 75 miles away on the Mississippi River.

The third tank barge and three others yet to be built will be used in transporting sulphur from Garden Island Bay on the Mississippi delta to Port Sulphur, a 45-mile upriver haul. Garden Island Bay, largest single sulphur development anywhere in the world in 20 years, is scheduled to get into production late next year.

The use of tank barges eliminates the need for costly storage facilities and the erection of large dock installations at the two sites.

Built into each of the 224-ft barges is a steel cylinder of 1000-ton capacity. A four-in. blanket of insulation and coils inside the cylinder through which steam will be piped during loading and unloading operations will keep the molten sulphur at a temperature of 300° F during shipment.

The barges, costing \$150,000 each, meet American Bureau of Shipping specifications for limited coastwise service since part of the route from Bay Ste. Elaine to Port Sulphur will be through open waters of the Gulf of Mexico. Steel canopies protect the cylinders from high water.

#### **United Electric Enters East**

The United Electric Coal Cos. leased, on June 15, 1952, the Skyline Mine, including No. 1 tipple and adjoining strip coal lands, from Pond Creek Pocahontas Co. This mine is located in Breathitt, Knott and Magoffin Counties of eastern Kentucky. It marks the first entrance of The United Electric Coal Cos. into the eastern coal field. Up to this time it has operated mines solely in the midwest.

The United Electric Coal Cos. will place one of its 30-yd stripping shovels in operation on this property. This will be the largest stripping shovel that has ever been used in eastern Kentucky.

Island Creek Coal Sales Co. will sell the coal produced under this lease. Output is estimated at 600,000 tons per year.

#### Old Iron Mine Reactivated

On May 20, 1952, the Minnesota Ore Division of the Jones & Laughlin Steel Corp. started shipments from its Wentworth mine. This property is located east of Aurora, Minn., on the Mesabi iron range. Wentworth mine has been under development since last year. It worked for a short period in 1915 but shipments amounted to less than a 1000 tons.

#### School Gets Mine Fans

New equipment installed at the University of Illinois makes its mine ventilation laboratory one of the most modern and complete in the nation, University officials have announced at Urbana, Ill. Two new fans of different types, one of them capable of ventilating a small mine, have been added to the equipment of the mining and metallurgy department of the university. One fan, which delivers up to 30,000 cfm, is an axial flow type. The other is a centrifugal type.

#### Award Doctor of Laws Degree to Howard I. Young

Howard I. Young, president, American Zinc, Lead and Smelting Co., and president of the American Mining Congress, received an honorary degree of Doctor of Laws at the Commencement Exercises of Lindenwood College, St. Charles, Mo., on May 31, 1952.

The citation was made by Dr. James W. Clarke, Minister, Second Presbyterian Church, St. Louis. Dr. Clark, in referring to Mr. Young, said in part, ".... represents in his person the infinite variety of the



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### IT LASTS!



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Before World War II, it was common to ship three tons of ore from every four tons of material mined on the Mesabi. At present, however, the ratio is one ton shipped for every four tons mined. Yet this falling ratio is more than made up for in increased man-hour productivity. In 1930, four tons of material were stripped for every man hour worked. Now six tons per man hour is the rule. Here one man and a machine are doing a job that took a number of men to do a few years ago. The International TD-24 tractor above is making a new road over a cliff to permit trucks removing iron ore from one of the large open pit mines to take a shorter, faster route to the top.

Fire Destroys Tipple

A fire in early May totally de-

stroyed the tipple at the Grishkowsky

mine, five miles south of Beulah, N. D. The fire originated in a slack

pile and was driven by the wind to

American Scene:-the plentitude of its opportunity, the genius of its industrial might, the warmth of its iriendship, the strength of its home life, the ardor of its patriotism, the sense of its community and the piety of its religion."

Mr. Young is at the present time Deputy Administrator of Defense Minerals Procurement Agency. During World War II, he also answered the call of the American Government when he served on the War Production Board.

#### Name New Aluminum Plant

Reynolds Metals Co. has named its new aluminum reduction plant, under construction in Arkansas, in honor of the late Judge Robert P. Patterson, general counsel and director of the company, who was killed in a plane crash at Elizabeth, N. J.

When plans were first made, the plant was to be known as the Arkadelphia plant, after the town in Arkansas near which it is located. However, after the tragic death of Robert P. Patterson the board of directors voted to call it the Robert P. Patterson plant.

Judge Patterson, former Secretary of War, had served as a member of the Board of Reynolds Metals Co. and as general counsel since 1947.

#### **Up Coal Estimate**

State Geologist E. P. Rothrock of South Dakota reports that the Isabel-Firesteel coal area in seven townships in Corson, Dewey, and Ziebach Counties, has more lignite coal beneath it the seven townships there are 166,-000,000 tons of lignite coal.

able machinery at once and by fall expects to be in full production.

#### Sinking Shaft at Iron Mine

ignite the tipple. All screens and other machinery, as well as two conveyors and two motors, were a total loss. The owner plans to erect port-

Pickands Mather and Co. are in the process of sinking a 3750-ft shaft at the Peterson iron mine, near Bessemer, Mich. On May 6, 1211 ft of the production shaft had been sunk.

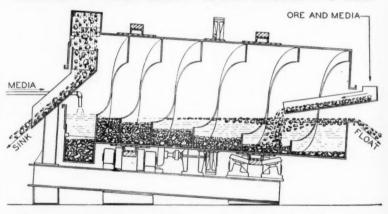
Plans for the new shaft were announced in November, 1951, by Pickands Mather & Co., agents of the Puritan Mining Co., owned jointly by Youngstown Sheet & Tube Co. and the Bethlehem Steel Co. The Peterson mine consists of properties formerly known as the Puritan, Ironton, Yale and Colby mines.

#### Mine No. 7 Closed

Mine No. 7 of the Peabody Coal Co., was closed June 1, 1952. Located at Kincaid, Ill., the mine was built by Peabody in 1912 and has been in operation ever since. During the life of the mine 45,105,325 tons of coal were produced there.

The closing of Mine No. 7 is part of a program instituted by Peabody

#### **HEAVY-MEDIA SEPARATORS**

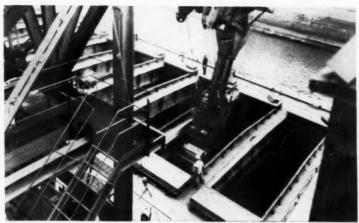


The Hardinge Counter-Current Heavy-Media Separator is a slowly-revolving, inclined, cylindrical drum with spiral flights attached to the inner surface of the cylinder. As the drum rotates, the "sink" is carried by the spiral flights to the high end. The "float" overflows a circular weir at the lower end.

The equipment has been well received and thoroughly tested on field applications. Repeat orders are now coming in—the best endorsement of all! Bulletin 39:B-52.

#### INCOR COMPANY, 0

than the original U. S. Geological YORK, PENNSYLVANIA—240 Arch St. Main Office and Works Survey estimated. He stated that in NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1 122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.



A new conveyor belt capable of loading a full carload of coal in one minute has been installed by the Rail-To-Water Transfer Corp., Chicago, Ill., making it one of the fastest coal transfer installations in the world. The belt, 72 in wide and 942 ft long, is designed to handle 3000 tph. It is fed by a five-car unloading facility. The belt was made by United States Rubber Co. The loading plant is located on the Calumet River. Coal originating in Kentucky and southern Illinois is dumped into hoppers through a vibrating feeder, then it passes up the main belt to two short belts which feed a universal chute emptying into boats for water shipment.

several years ago whereby old uneconomical mines are being abandoned as new properties are constructed.

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Peabody contemplates closing no further mines in this area after Mine 7. It is the belief of the company

officials that the interval between the closing of Mine 7 and the opening of Mine No. 10, its newest mine, will mark the low point of available employment at Peabody mines and the trend from now on will be upward.

#### Sales Engineer -(Field)

Immediate opening available for a graduate engineer with a minimum of three years sales experience in construction machinery or large scale earthmoving equipment. This is a permanent position entailing field engineering sales assignments for a leading manufacturer of large earth haulage equipment with a worldwide sales organization.

In reply please include full qualifications, salary desired, willingness to relocate and travel, Box 17, in care of this publication.

#### Plan Canadian Zinc Refinery

A recent press dispatch from Quebec states that Chicoutimi, 140 miles east of Quebec, has been selected as the site of a projected multi-million dollar zinc refinery. Premier Duplessis reported that he had been informed by Andrew Robertson, an official of Barvue Mines, Ltd., and affiliated mine concerns, that the thriving Lake St. John district town had been picked as the site of the refinery. Barvue Mines has started zinc mining operations in Barraute Township, northwestern Quebec. Availability of hydro-electric power in the Lake St. John district and accessibility were deciding factors in choosing the site.



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MANHASSET N Y



#### Lavender Mine Progresses

Phelps Dodge Corp, has awarded a contract to the Fisher Construction Co. of Phoenix, Ariz., for the concrete portions of the new copper mill at Bisbee, Ariz. Construction is to start immediately with completion of the major portions of the structure within 11 months.

The mill will handle the ore from the new Lavender open-pit mine where stripping operations have been in progress for more than a year. At present the company is moving from 40,000 to 50,000 tons of rock every day, a tonnage which is said to equal the movement of waste material during the development of the Morenci open-pit mine just prior to World

#### Celebrate Golden Gold Anniversary

The 50th anniversary of the discovery of gold in the Fairbanks district of Alaska will be held in July. Felix Pedroni discovered gold here on July 22, 1902 and located his discovery claim on July 25, 1902. Igloo No. 4 of the Pioneers of Alaska is sponsoring the affair. A permanent monument will be placed near the site of the present temporary one on Pedro Creek and will be dedicated during the celebration. Dr. Alvaro Vito Beltrani, Italian vice consul at Seattle, and Baron Filippe Mayo Flaconi, the Italian Consul General at San Francisco, will head the delegation from his country to honor Pedroni.

#### New Oil Shale Drill

Development of a new hydraulic rotary drill that will sink vertical blast holes in the Colorado oil shale "much faster and cheaper" has been announced by J. H. East, Jr., regional director of the Bureau of Mines at Denver, Colo. The drill will cut through the Rifle shale at the average rate of 69 in. a minute and has cut drilling labor costs in half. In experiments conducted at the experimental mine at Rifle, Colo., a two-in. bit penetrated the tough shale rock for 184 ft without sharpening. cussion equipment, usually used at the mine, can only drill at a rate of 20 in. a minute.

Electrically driven rotary drills

have been tried, but these lack the flexibility needed because of the shale's varying degree of drill resist-Compresed air-driven rotary drills have been used, also, but excessive bit breakage was experienced with them. The newly developed drill permits speed, torque and thrust to be varied widely. So far, East said, the experiments have been devoted mainly to the drilling of vertical holes, but he and the designing engineers predict that similar savings will be made in horizontal drilling.

#### Give Coal Scholarship

Four year scholarship for the study of coal mine engineering at the University of Utah was offered this year by the United States Fuel Co., according to G. R. Watkins, general man-The annual stipend for the four year award was increased from

\$400.00 to \$500.00. Applications for the college year beginning September, 1952, were closed on May 15, 1952. The recipient of this scholarship will be announced later this summer. The scholarship was open to any graduate of an accredited high school or its equivalent since January 1. 1951, but sons of company employes, if competitive with an applicant who is not so related, will be given prefer-

#### Rare Earth Production Near

Production from the world's richest rare earth deposit, discovered several months ago in San Bernardino County, Calif., is expected to get under way soon. Molybdenum Corp. of America, which took over the find and recently completed a preliminary test-drilling program, has successfully worked out most of the technical problems for handling the ore.

Molvbdenum's lease covers about 20 acres it is reported, with some bodies ranging up to 40 percent rare earths. Some 20 percent of the entire lode is barite, which can be sold for use in the manufacture of drilling mud for the petroleum industry. This deposit is expected to make it practicable to develop a whole new range of uses for the rare earth metals because of the size and availability of the find.

#### Lower Mine Haulage Costs

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#### Hazards of Truck And Conveyor Haulage

(Continued from page 28)

are all of our employes, including the office force. All employes are required to wear hard hats in the crushing and conveying plants as well as in the pit. Goggles are required on some jobs. These three items of safety equipment have prevented many injuries.

Considerable time has been spent in educating the attendants in correct methods of scraping accumulations from pulleys and hoppers.

All idler grease connections are piped out into the clear on one side of the conveyor to eliminate reaching into the dark under the belt or crawling under to the far side. Important pulley bearings are greased by automatic lubricators.

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The take-up weights on each conveyor are generally suspended over some area not open to traffic. They require safety cables on each as an assurance that they do not fall. Wherever possible the areas are enclosed to keep employes out.

Then, too, such safety features as correct lighting, non-skid walkways, railings, guards on all drives, proper stairways, etc., are small, but necessary, precautions to prevent accidents. Constant inspections control these features.

In conveying dusty material, dust collecting systems are important. In the crushing plant dust collectors have been installed at every point possible. In exceptionally dry, dusty weather, the ore is sprayed with water as it is dumped into the primary crusher, and at various stages throughout the conveying system to the storage silos at the concentrator. There the process becomes a wet one eliminating the dust hazard.

#### Over-All Program

The pit and entire plant cooperate in the same safety program. This includes Central Safety Meetings, Workmen-Foremen Meetings and Foremen personal contacts with the employes. Unsafe Practice and Condition Report forms are available for all employes use.

The U.S. Bureau of Mines keeps a constant check on our mining operations and New York State Factory Inspectors inspect our plants. In addition, we are responsible to our parent corporation-Jones & Laughlin Steel Corp. in which safety has become a predominant factor through the guidance and insistence of the Chairman of the Board, Admiral Moreell, and president C. L. Austin,-to uphold our place in the corporation's over-all safety program.

#### Production at Daulton Soon

Rehabilitation of the Daulton copper mine near Raymond, Calif., has been completed to the sulphide ore zone at a depth of 350 ft. A concentrating plant has been built and production is expected to start soon. The Daulton, an important producer in the late 1800's, was leased and reopened in 1951 by E. B. Smith.

#### **Silver Bell Homesites**

A contract for 100 housing units has been let by American Smelting and Refining Co. as the first step in building the town of Silver Bell, 40 miles from Tucson, Ariz., for its Silver Bell unit. The contract went to the Utah Construction Co., which constructs the two- and three-bedroom units at Tucson complete even to plumbing, wiring and plastering, then transports them by truck to the town-

At the mine-site, stripping has been started by Isbell Construction Co. Two five cu yd shovels working two shifts, load the waste into 30-ton capacity trucks.

Silver Bell is being readied for production under an agreement made with the Defense Materials Procurement Agency. A. S. & R. will finance the cost of placing the property on an operating basis of 225,000 tons of ore per month. Out of the first 197,000 .-000 pounds of copper produced the U. S. Government will purchase 177,-000,000 pounds at 24.5 cents per lb, subject to adjustment for operating costs, provided this quantity of copper cannot be sold at that price or higher in the open market. The commitment on the part of the government terminates 51/2 yr from the start of production.

Estimated production of copper from the Silver Bell Unit will be at the rate of 36,260,000 lb of copper annually. Barring delays in obtaining equipment, the property should be

in operation early in 1954.

#### Marget Ann Active

L. M. Peck, an executive of the Mitchell Mining Co., has announced that his company has plans under way to develop new ore bodies at the Marget Ann claim in Butte, Mont. The company is opening new levels and expects to ship ore to a smelter A winze has just been completed from the 300-ft to the 400-ft level where the additional ore bodies will be developed. The company purchased the Marget Ann in September, 1950. Six major structures have been







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intersected on the 300-ft level. Stoping operations are continuing on the 300-ft level at the rate of two or three cars a week. E. M. Olmsted is president and mine manager of the company.

#### To Hold Foreign Mining Congress

During April and May, 1953, the Fifth Empire Mining and Metallurgical Congress will be held in Australia. The chief object of the Congress is to afford an opportunity to mining engineers, metallurgists, scientists and others concerned with the mining and metallurgical industries to meet and discuss technical progress and problems, including the development of mineral resources of the British Commonwealth nations.

Included in the program, which is divided into five parts, are meetings, technical sessions, and visits to mining and metallurgical centers. Technical sessions will be held in Melbourne and Sidney.

#### Open New Area to Prospecting

The Atomic Energy Commission recently announced it is throwing open the Capitol Reef National Monument in Wayne County, Utah, for uranium exploration. The announcement has stirred up a growing interest in the area, controlled by the National Park Service, with numerous inquiries being received at the Grand Junction office of the Raw Materials Division of the AEC. However, no request for prospecting permits have been received from any major mining companies.

The type of permit being offered to prospectors is good for seven years, but may be cancelled at any time by the Department of Interior. While in the area, prospectors will be subject to Park Service rules, not AEC rules, in conducting their operations.

#### Plan Hydraulic Mining

Hydraulic mining, a rare event in California under present-day conditions, is planned near Hollister, Calif., by E. A. Julian and Norman Thorkelson. They are seeking a permit from the California Debris Commission to operate the Higgins Ranch mine near Downieville by hydraulicking, drain-Tailings ing into Goodyear Creek. would be stored behind Bullards Bar Dam. Located in a region noted for lode and placer gold production, the Higgins Ranch is said to contain extensive deposits of gold-bearing gravel. The property is on a channel which was among the richest gold producers in Sierra County's early

#### **Develop Montana Iron**

The Virginia Iron and Steel Co. reports that it plans to begin development work on iron deposits north of White Sulphur Springs, Mont., where it owns 21 claims. Work will involve construction of about 50 miles of railroad between Wilsall and Ringling.

#### More Copper from Nevada

Another copper mining operation has been started in the Yerington, Nev., area. Copper Butte Mining Co. has leased the Buckskin property, west of Yerington, for five years, and is rehabilitating the main tunnel and other old workings. Manager N. L. Brown reports the Buckskin contains undeveloped sulphide copper ore and that the company plans construction of a concentrating plant with a capacity of 50 tons of ore daily.

#### **Bentonite Mill Busy**

Utah Bentonite Co., recently began production at its Cannonville, Garfield County, Utah, mill, according to Robert N. Cooper, manager. The mill is expected to expand with the development of the oil industry in the Intermountain area. Bentonite is used in oil well drilling and fertilizer production.

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ROCK BOLTS

1117

#### Ship Utah Sulphur

Rail shipments of sulphur have begun from the Chemical Corporation of America's new pilot mill and plant at Sulphurdale, Utah, according to C. R. King, mining consultant on the project. King said the operation was a success, although there were still some "bugs" to be worked out in the system for refining sulphur concentrates from the froth flotation type mill. The present operation represents the third attempt in the last 20 years to mine and mill the Sulphurdale ore commercially.

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Sulphur at Sulphurdale exists as a matrix in a conglomerate of rock and fine sand. After simple froth flotation, an 85 percent concentrate of sulphur is produced. This is burned and filtered. A future by-product use for the filter cake—about 50 percent sulphur—may be found in the manufacture of soil sulphur for agricultural use.

The mill was designed to handle 100 tons a day, but production runs have proven it can handle up to 200 tons a day. The refinery turns out from 20 to 40 tons of elemental sulphur daily. Proved reserves of the low-grade sulphur total 3,000,000 tons, with probable reserves around 6,000,000 tons. A diamond drilling program is scheduled this spring to block out more reserves. The ore is mined by open pit methods.

#### **Reclaim Dredged Land**

Dredge operators, working in the Cascade Basin near Boise, Idaho, have announced plans to level tailing mounds, plant range grass and try to eliminate discolored waters on the north fork of the Payette River. It has been reported that dredge operators have been successful in testing grass seeds best suited for growth on tailings and seeking means to eliminate discolored waters. Reclamation work will proceed with the coming of warm weather.

#### **Scholarships Offered**

Three more scholarships to the University of Utah's College of Mineral Industries were offered by United States Smelting Refining and Mining Co., according to an announcement by W. C. Page, vice-president and general manager of western operations. Annual stipends for the four year awards were increased from \$400.00 to \$500.00. Any graduate of an accredited high school or its equivalent since January 1, 1951, was eligible. Sons of company employes, if competitive with an applicant who is not so related, will be given preference. Application for the college year beginning September, 1952, were closed on May 15, 1952.

In addition to the above scholar-

ships the company is also offering a special one year \$750.00 scholarship at the University of Utah to a college senior or graduate student in the mining, geology, or non-ferrous metallurgy field. The recipient would work on a specific problem relating to the company's operations.

#### Manganese Tests Started

First section of a pilot plant built at Boulder City, Nev., for experimental treatment of manganese ore is in operation. The pilot plant, with a capacity of 50 tons daily, will be used to develop processes for treatment of ore from the Artillery Peak district of Arizona. A supply of 2500 tons of the complex, low-grade ore from the Arizona deposit has been shipped to the plant and stockpiled for the testing program. The Artillery Peak deposit is one of the largest in the country, but the ore requires extensive processing. Laboratory and semi-pilot plant tests by the USBM have shown that the ore can be concentrated into nodules equal to high grade imported ore by enriching flotation concentrate with manganese oxide recovered from a portion of the concentrates by a chemical process.

Pilot plant tests will provide technical and economic comparisons of the various possible methods for making ferromanganese from Artillery Peak ore. The manganese dioxide prepared in the plant also can be used to make dry cell batteries and manganese chemicals. The plant was designed by the technical staff of the Salt Lake City station of the U. S. Bureau of Mines.

#### Wheels of Government

(Continued from page 57)

lem of materials market stability must be sought through international agreements in which the United States will have to take a leading part." The Report states that the International Materials Conference and the allocation recommendations made thereunder are having some stabilizing effect on the prices and markets for materials during the present emergency. "International buffer stocks" are advocated for materials such as copper, lead and zinc, under which parties to an international agreement would announce a price floor and a price ceiling for a predetermined period. The Commission believes that by buying when prices approach the floor and by selling stocks when prices approach the ceiling, buffer stocks operations would help to confine price fluctuations to a moderate range.

Careful reading of the Report is necessary for a full appreciation of the viewpoint of the Commission and

#### **Reopen Amador Mine**

The Amador copper mine, near Superior, Mont., reopened early in February under a Defense Minerals Administration loan. Discovered in 1889, the mine was actively developed in 1900. A smelter was started in 1905 and completed in 1907, but the mine closed during the panic of that year and has not operated since.

#### Tonopah King Active

The 300-ft King of Tonopah shaft at the Tonopah Development property, one mile north of Tonopah, Nev., has been repaired and the management is preparing to extend an old 100-ft drift 700 to 800 ft from the bottom of the shaft.

#### **Truck Road Construction**

(Continued from page 44)

face without fully knowing the adequacy or inadequancy of what is underneath.

#### . Tests Improve Roads

At Maid Marian a C.B.R. test on the local river gravel supply proved it to be inadequate for paving as the size consist was such that proper compaction could not be obtained. Time did not permit further sampling of other materials within economical haulage distance. However, several sand hills nearby give promise of closely approximating bank gravel which might prove suitable.

The tests by Goetz and Yoder have been a great help to the operators of Maid Marian, but, unfortunately, the time factor did not permit them to take full advantage of the results. Fire clay proved an improvement over shale and an even better improvement could have been made by using the parent drift material that was right at hand. They could have saved considerable time and expense with a better road resulting by using Le-Tourneau scoops to apply compacted layers of the same clay material they were handling to construct the subgrade. It is felt that further analysis of local materials within economical haulage distance will yield better sources of base material for future road construction.

The lesson to be learned is this: if you are not satisfied with your haulage roads, look around—maybe you can find a better construction material or, if your roads are satisfactory, perhaps there is a material that is just as good, but cheaper to apply. A road starts deteriorating right after it is built and no matter how well you build it, only intelligent and continuous maintenance of the surface, and good drainage, will keep it in shape.



#### Speed Up Coal Drilling

A new bit that drills brittle coal at unusually fast rates of penetration is now offered by Kennametal in the Style DL Series. According to the manufacturers, faster drilling is obtained by reducing the amount of surface contact of the cutting edge



at the bottom of the hole. Also, steeper clearance angles are provided to minimize bit drag. These features have been obtained by tapering the insides of both prongs at a 60° angle and providing maximum clearance. The new design is said by users to penetrate at the rate of 10 percent to 20 percent faster than the conventional Kennametal all-purpose bit. The new Style DL Bit is more limited in applications in that it is used to drill coal where there are few impurities. Another important feature of the DL Series is low power consumption and consequent lower drill maintenance cost.

Kennametal Style DL bits are available with square shanks in sizes of 1% in, to 3 in.

#### Clean Safety Equipment

Personal safety equipment—faceshields, respirators, mask facepieces, ear defenders, clothing—can be cleaned and sanitized thoroughly, quickly and with ease by use of the new "MSA Cleaner-Sanitizer," according to the manufacturer, Mine Safety Appliances Co.

The Cleaner-Sanitizer is in dry powder form, 25 one-oz. envelopes to a carton, and is easily stored, safe and convenient to handle. The user simply adds an ounce of the powder to a gallon of lukewarm water. Equipment is cleaned, rinsed and allowed to air dry. No soap film remains, and the equipment is thoroughly clean. Bacterial count is reduced to levels judged safe by public health standards, the manufacturer reports.

Detailed information is given in Bulletin No. CM-18, available without obligation from Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

#### Open Kansas City Office

Hewitt-Robins Inc., have opened an additional office in the Porter Bldg., 406 W. 34th St., Kansas City, Mo., it was announced by Lester D. Bigelow, vice-president in charge of the Central Sales Division.

In charge of this office will be Robert E. Crane, field engineer, who will represent three of the four corporate Divisions: Hewitt-Rubber, Robins Conveyors and Robins Engineers.

#### Improve Fine Screening

The Deister Concentrator Co. has introduced a screen heating device for attachment on their Leahy screens. Called FlexElex, the screen heater



makes the screening of wet materials much easier by keeping screen wires warm and dry, preventing a build-up material and the binding which ultimately accompanies this situation.

Complete information may be had from the company at 901-935 Glasgow Ave., Fort Wayne, Ind.

#### Hydraulic Drill Introduced

Schroeder Brothers, 3116 Penn Ave., Pittsburgh 1, Pa., have developed a new hand-held, hydraulic drill for use in coal mines. Called the Schroeder Hydraulic Hand-Held



Coal Drill, its development is keyed to the increasing demands for the reduction of electrical hazards and lower costs in the coal industry.

Hydraulic power for the drill is usually taken from the hydraulic system of a universal coal cutting machine. Drilling speed is high—eightholes, three in. in diameter, have been drilled in as little as 12 seconds according to the manufacturers.

#### Get Better Samples

Denver Equipment Co. has acquired exclusive manufacturing and sales rights to the Automatic Sampler formerly known as the DECO SL Sampler produced by the Heginbotham Equipment Co. of Salt Lake City. The unit, to be known as the Denver Automatic Sampler, has been thoroughly tested in mill operations and, according to DECO, has proven valuable in obtaining the accurate wet or dry sample cuts so necessary for reliable mill control.

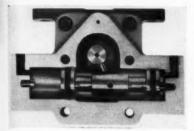
Sliding contact has been replaced by carriage assembly on ball bearing rollers. The cutter, with standard travel of either 16 or 21 in. is actuated by means of a positive chain and sprocket drive. The driving unit is a gearmotor operating at intermittent intervals.

A limit switch shuts off the motor at the limits of cutter travel. The time switch reactivates the mechanism according to the established sampling cycle. Overtravel of the cutter is prevented by a magnetic brake on the end of the motor shaft.

A manually operated switch can be used to operate the cutter at other than its set time cycle.

#### **Power Operated Valve**

Ledeen Manufacturing Co., Los Angeles, manufacturers of air and hydraulic cylinders, valves, valve actuators, air-oil pumps and accessories, announce the POV Power Operated Valve, available in six sizes, suitable for air, oil and water operation with



option of finger, cam, toe or solenoid pilot controls.

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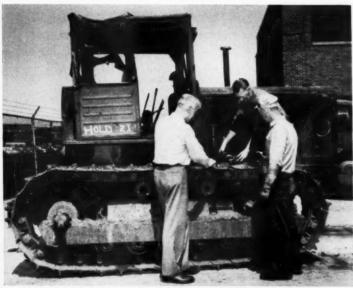
This power operated valve is essentially a standard four-way valve, but the rotation of the disc is accomplished by means of a piston

moved by the operating fluid pressure of the main line, and controlled by small pilot valves suitably located and actuated. Applying pressure through the pilot on one end of the piston forces it to move ahead and rotates the valve disc to forward position. Applying pressure on the opposite end moves the piston back and rotates the disc to reverse position.

Complete information including illustrations, and circuit diagrams, are detailed in Bulletin 1000 which will be sent upon request by writing Ledeen Manufacturing Co., 1600 So. San Pedro St., Los Angeles 15, Calif.

#### **Dedicate New Plant**

On Saturday, June 7, Harnischfeger Corp. officially opened its new Diesel Engine Division in Crystal Lake, Ill., bringing to nine the number of P&H plants now in operation. In this new building, P&H expects to triple production of its line of twocycle diesel engines for stationary, mobile and marine service.



Contrary to the current popular opinion, the Russians' keen knowledge of engineering and mechanics has been revealed probably for the first time in research on a track-type tractor which is a metric copy of a well-known U. S. manufacturer's machine. Two well-built Red tractors—the Stalinetz 80— have been given detailed examinations by the Research Department at Caterpillar Tractor Co.. Peoria, Ill., and were found to be copies of Caterpillar's D7. J. M. Davies, research director, said, "In our opinion, they are a well engineered, well manufactured copy, reflecting Russian practices, Russian machine tools and the raw materials available to the Russians." Inspection revealed these sobering facts: 1. The Reds redesigned the machine to fit more convenient metric dimensions—no mean engineering feat. 2. Appearance was unimportant. The parts are rough on the outside, but careful attention was given where part finish and close tolerance is needed. Antifriction bearings are very good. 3. Although raw materials available differ slightly, metallurgy on the Red copy is very good. 4. The tractors probably were produced on an assembly line basis. Davies said "These machines were a great surprise to us. They are of much better quality than we had expected." The two Red tractors were captured in a battered condition by troops in Korea. Because the pair were obvious copies of a standard Caterpillar D7, the Army's Corps of Engineers asked Caterpillar to make an examination. However, the information has been restricted until only recently.

#### Replace Clamshell Teeth

Of interest to operators of clamshell buckets is a new reversible and replaceable cutter recently announced by the Blaw-Knox Co., manufacturer of clamshell buckets. The new unit



replaces the old type, one piece tooth presently used.

Similar in principle to the two-part tooth used so successfully in draglines and trenchers, the new tooth consists of a base which is permanently attached to the scoop, or lip, in the usual manner, and a reversible and renewable tip which fits into a slot and wedges itself into the base.

Bulletin 2399 which fully describes this new accessory will be furnished upon writing to the Bucket Department, Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

#### —Announcements—

At a special meeting of the board of directors of Macwhyte Co., Keno-

sha, Wis., wire rope manufacturers, George C. Wilder was appointed a director to fill the unexpired term of the late Jessel S. Whyte, and was elected president of Macwhyte Co. Wilder was vice-



president and assistant general manager and has served in various capacities since joining the company in 1938.

Paul E. Hays has been appointed assistant superintendent of river transportation for Crucible Steel Co. of America. He will assist in the operation of Crucible's river boats which carry coal by barge from the company's mines at Crucible, Pa., to Midland, Pa., Works and to Park Works in Pittsburgh.

The majority stock of the Mosebach Electric & Supply Co., 1115 Arlington Ave., Pittsburgh 3, Pa., has been acquired by Ray Hampton and L. H. "Jiggs" Hampton. Mrs. Karl J. Mosebach, co-founder of the firm, has resigned as treasurer and chairman of the board after 27 years of service.

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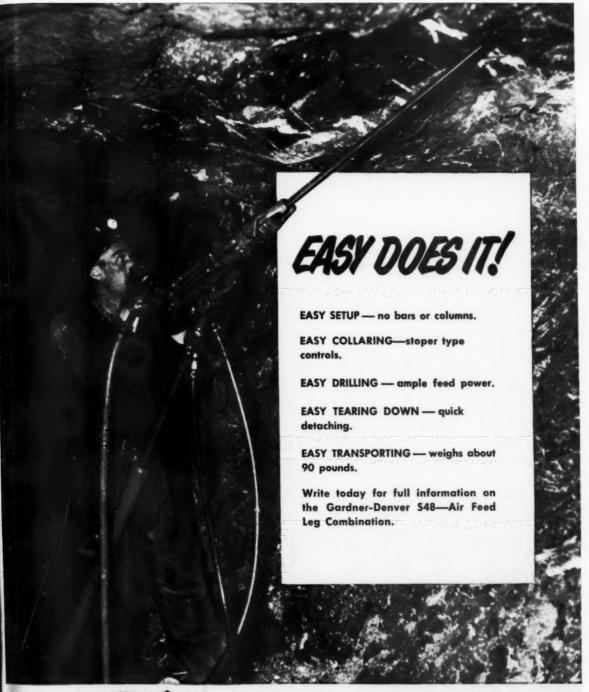
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